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Water Filter for South Norwalk, Conn.

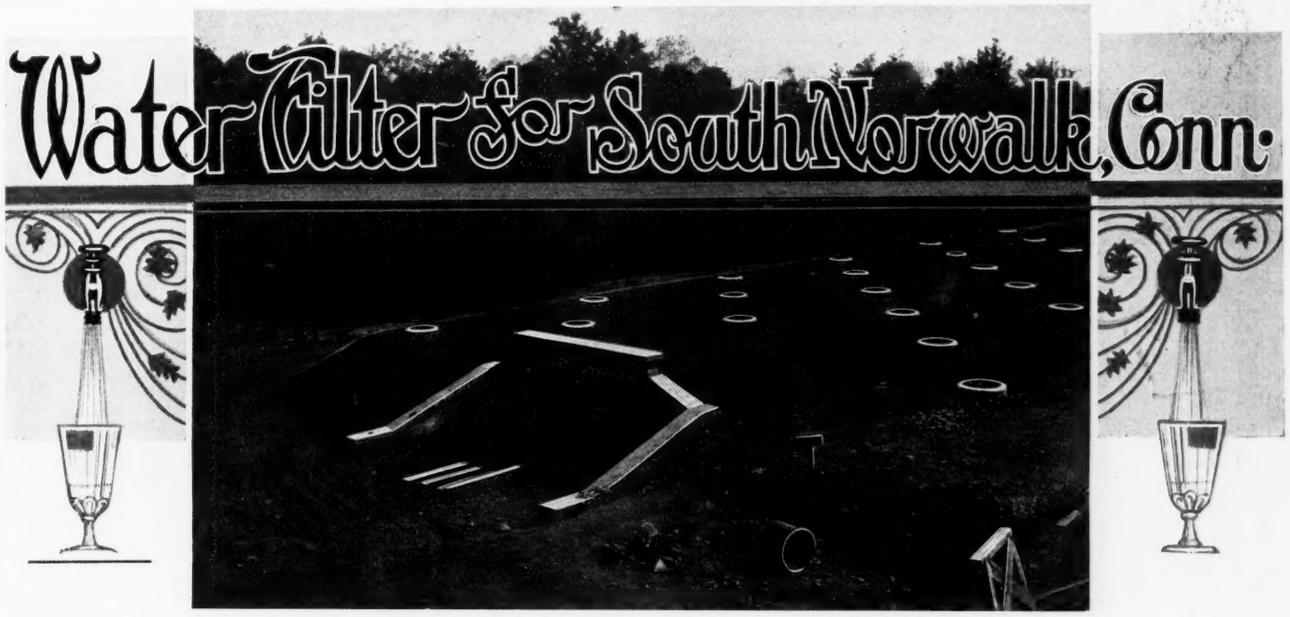


FIG. I. SECONDARY FILTER, SHOWING ENTRANCE AND MANHOLE TOPS

WHILE South Norwalk, Conn., has never been visited by an epidemic of disease due to its water supply, it always has suffered from discolored and offensive-smelling water, due to the large amount of algæ contained in it. Realizing the need of remedying this condition, the Board of Water Commissioners of the city had a bill passed by the Legislature enabling the Board to raise $100,000 for the construction of a filtration plant. It might be said here that these bonds have not yet been offered for sale and that the money for the work has been secured from the local banks on short time notes at a nominal interest.

The Board of Water Commissioners, composed of Christian Swartz, Stephen S. Hatch and Franklin A. Smith, employed Wm. S. Johnson, of Boston, Mass., to draw up plans for a filter and appointed H. W. Clark, of the Lawrence Experimental Station, as Consulting Engineer. The contract was let to the Bunting Construction Company, of New York City, for $70,000, the contractors to do all work and furnish all material, except the pipes and valves and the furnishing, washing and placing of the sand and gravel for the filter beds. S. W. Hoyt, Jr., was appointed engineer in charge of the work.

The water for the city of South Norwalk is obtained from three ponds located in the town of Wilton, about six miles from the city. These ponds have a total storage capacity of about 700,000,000 gallons and give a head of about 185 feet at the center of the city. This head will be cut down about 27 feet by the introduction of the filter, which is operated entirely by gravity. The site chosen for the filter is about 1,000 feet south of the lowest pond.

Water is led from the lower pond by means of an 18-inch cast-iron pipe, called the raw water pipe, to a concrete aerating chamber which holds the aerating box. This box is made of steel and is 9 feet 3 inches by 6 feet 6 inches by 4 feet. The raw water pipe is connected to the bottom of this box and the water flows into the box and is discharged through 7,500 3-16-inch holes spaced 1 inch on centers. This arrangement mixes the water thoroughly with the air and is for the purpose of freeing it from odor. The primary filter is made up of four beds, each 145 feet long by 78 feet 4 inches wide and having a capacity of 1,250,000 gallons each. It is expected that three will be in use at one time, the fourth to be used when any of the others is disabled or is being cleaned. From the aerating chamber and along the ends of the filter beds in the pipe gallery, mentioned later, runs an 18-inch raw-water main having 12-inch outlets into the inlet chamber of each bed. The height of the water in the filter beds is regulated by an automatic valve located between the aerator and pond.

FILTER BEDS

The floors of the filter beds are made of concrete 6 inches thick at the inverts and 15 inches thick under piers.

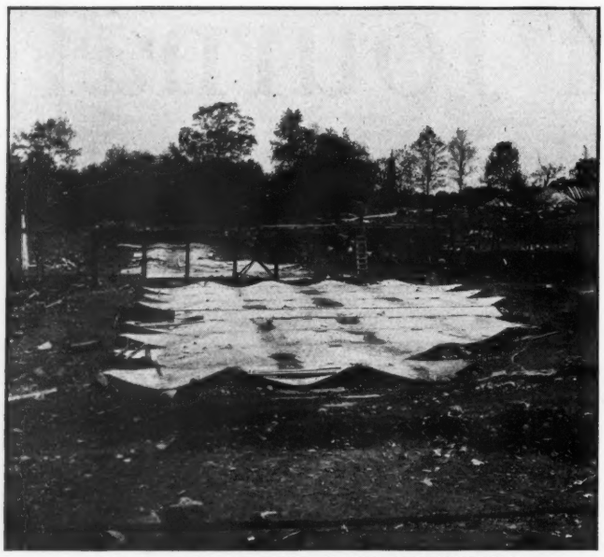


FIG. 2. FLOOR OF FILTER UNDER CONSTRUCTION

There are fifty piers set 13 feet 4 inches apart on centers, with 28-inch square bases and 20-inch tops. These piers are shown in several of the illustrations, one showing the forms and another the method of keeping them from drying too fast.

The piers support the groined arch roof which, at the summit, is 6 inches thick. The roof is depressed over the piers, and is there about 7 inches thick. This depressing of the roof was done to save concrete, about one yard being saved at each pier, but caused complications in the forms which nearly obviated any saving effected. (The roof forms and the method of supporting them, as well as the thickness of the concrete, are shown in the illustrations.) Drainage holes are led from the depressions to the filter chamber. In the roof of each chamber are thirty manholes, each 3 feet in diameter, and rising 2 feet 3 inches above the roof. At the top of each manhole is an iron ring, which will support two iron covers with a dead air space between them. These manholes are for the purpose of introducing the filtering material to the beds. The roof of the beds will be covered with two feet of dirt and loam, which will be made into a lawn, above which the manholes will project three inches.

FIG. 3. FORMS FOR PIERS

The outside walls of the bed are three feet thick at the bottom and two feet thick at the top, with the batter on the outside. The division walls are three feet on the bottom and 18 inches on the top, and are battered both ways. No reinforcing was used in any of this work.

Laterals of 10-inch split tile lead from the side walls and connect in the center to the main channel, which conveys the water to the effluent pipes. This main channel is 2 feet 10 inches wide by 9 inches high and is made with a concrete beam on each side supporting reinforced concrete slabs. Around the laterals is placed by hand a layer of stone seven inches thick. These stones are not more than three inches, and not less than one and one-half inches in diameter. On top of this is placed a two-inch layer of stones, which will pass a 1½-inch hole but will not pass a ⅜-inch hole. Over this is put a layer of gravel, and last there is placed a layer of sand 3 feet 9 inches deep, giving a total depth of filtering material of 4 feet 6 inches. All the material was washed in a trough washer. When the filter bed is filled there will be four

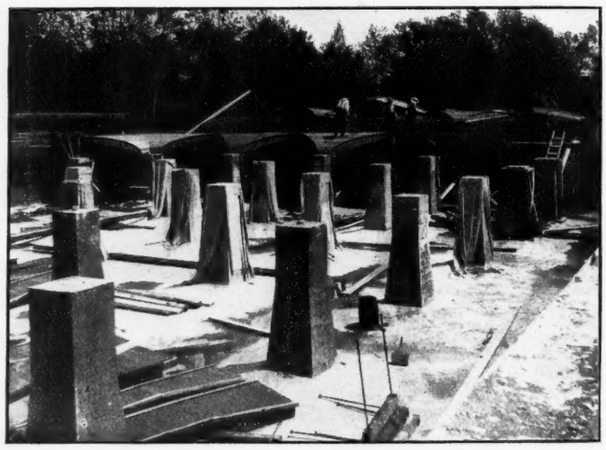


FIG. 4. PIERS PROTECTED FROM SUN BY WET CLOTHS

feet of water over the top of the sand. As before mentioned, this height is maintained by an automatic valve, but to provide for any accidents an overflow pipe has been put in which discharges into a sewer.

For purposes of scraping and cleaning, a large opening is left at the end of each bed. This is closed by iron doors three inches thick, which effectually keep out the frost. These openings are made in the shape of barrel arches in the roof, which start at the fourth bay and gradually rise until there is head room of seven feet at the entrance, with the sill one foot above the water level. Two runways, made of two 4-inch by 12-inch hard pine plank and supported by 5-inch I-beams, lead from the opening to the center of the bed. Fig. 6 shows the appearance of the bed before the material is placed. In the right hand corner can be seen the inlet box with slabs removed.

Pipe Gallery

Along the east end of the primary filter beds runs a concrete pipe gallery, which is 13 feet between walls and 243 feet long. The two pits shown at the left of the wall in the center of Fig. 5 are part of the operating house, not shown.

This gallery carries all the pipes. The larger pipe on the ledge is the 18-inch raw water supply to the filter beds. The smaller pipes lower down are the 14-inch effluent pipes leading from the beds to the operating house. Two of the venturi meters can be seen under the two men standing on the bridge. Leading from this gallery into the beds are also the discharge pipes which connect with the sewer. Behind the right-hand man are barely visible the valves that operate these pipes.

The roof of the gallery is flat and made of six-inch concrete, reinforced with half-inch twisted steel bars. The roof is supported on concrete beams 12x18 inches, reinforced by four 1-inch twisted steel bars. The beams are spaced six feet on centers.

FIG. 5. PIPE GALLERY

Operating House

This also is of concrete. The operating floor is reinforced with ⅜-inch twisted steel bars. From the floor of the operating house to the wall plate is 21 feet, and above this is a slate roof. From the main floor an iron stairway leads to the water chamber beneath, and a spiral stairway leads to the laboratory on the second floor. In this laboratory analyses will be made of the water as often as necessary, and a record of the rainfall kept as it is indicated by the automatic gauge. On the operating floor are located the stems of the Ludlow valves, which control the pipe arrangement. Underneath the operating floor are three water chambers, one of which contains a very important feature of the plant, viz., a second aerating box exactly like the first one already described. The purpose of this second aerator is two-fold: first to remove any odor that the water might still contain, and, second, to replace the air that may have been taken out in the primary filter. This air is not much reduced in passing through the secondary filter because of the rapidity of the flow.

Here are also located bypass valves, by which the raw water can be fed direct to the city mains or to the sec-

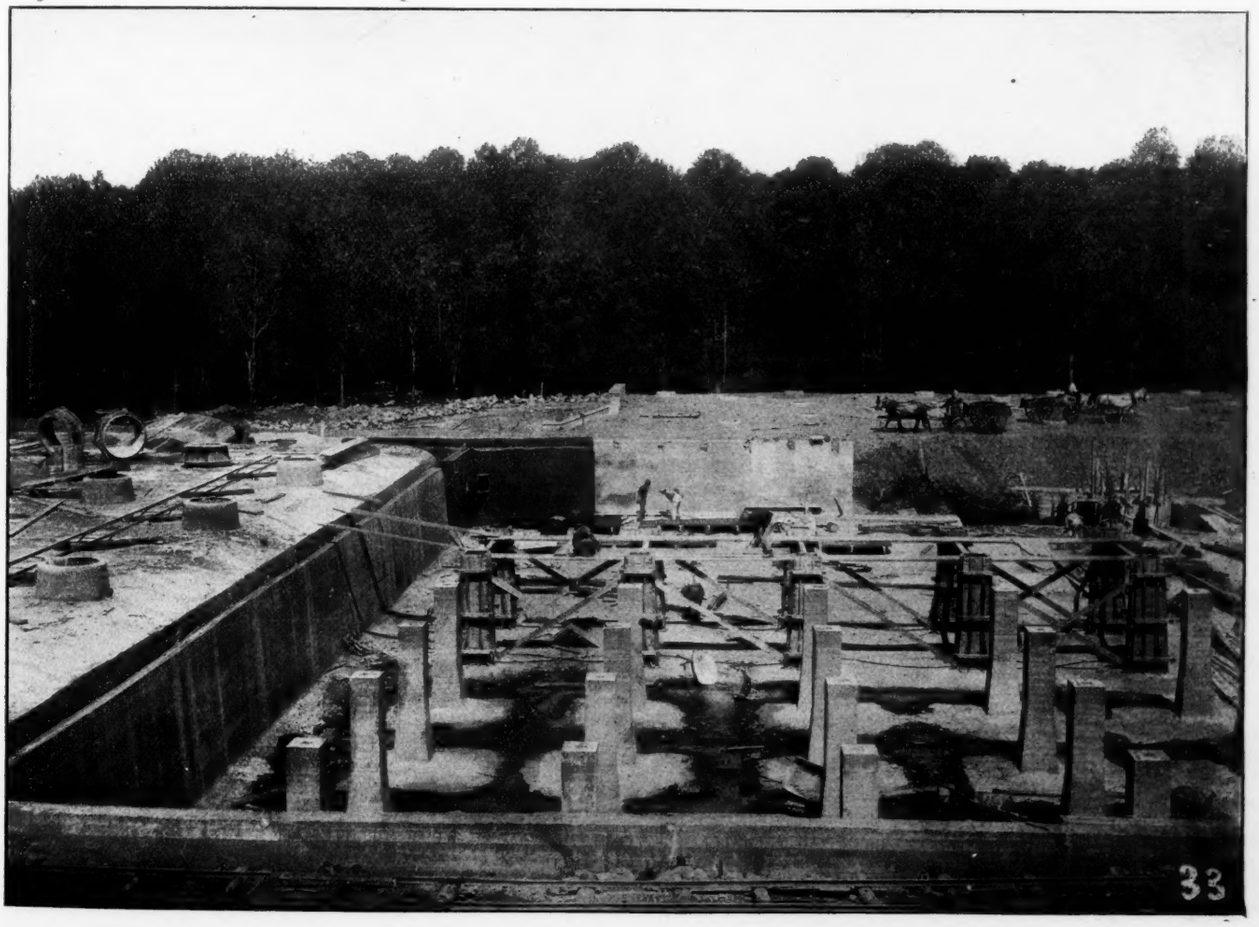


FIG. 6. COMPLETE AND INCOMPLETE FILTERS, SECONDARY FILTER IN BACKGROUND.

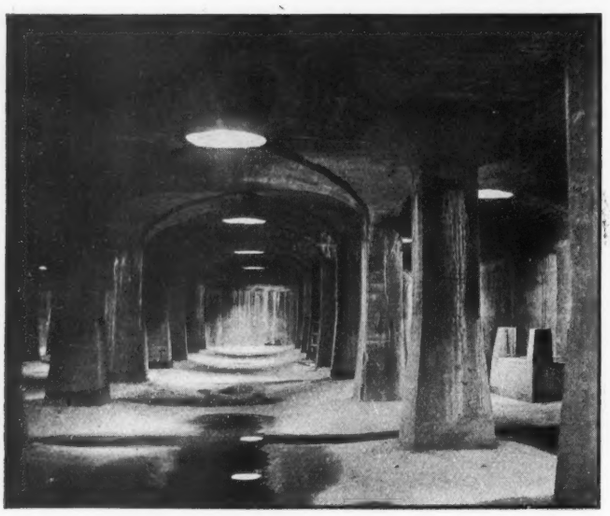


FIG. 7. INTERIOR OF FILTER

ondary filter. Arrangement is also made so that water can be run directly from the primary reservoir to the clear water basin without first passing through the secondary filter. A system of valves is also provided, so that, after a bed is cleaned, it can be filled with water, through the effluent pipe, from the other beds.

Secondary Filter

The secondary filter is an exact duplicate in construction and capacity of a single one of the primary beds. The only difference is that this bed will have coarser sand than the primary one. All the water from the four primary beds will have to pass through this secondary bed. While it is expected that all the bacteriological pollution will be removed in the primary bed, it is possible that some of the coloring matter may not be removed, and this is the function for which the secondary filter is designed.

Clear Water Basin

Immediately to the south of the secondary filter is located the clear water basin, with a capacity of 250,000 gallons. This is 91 feet 8 inches by 78 feet 4 inches, and is constructed like the filter beds, except that it has a flat waterproof roof. This is connected through the operating house to the city mains. The chief object of this clear water basin is to take care of the fluctuation in the demand for water, so that the filters may operate at the same rate, regardless of the demand. The minimum capacity of the plant is 3,000,000 gallons per day, but, if necessary, can be operated to give 5,000,000 or 6,000,000 gallons.

The city was fortunate in being able to secure a sand supply sufficient to last 200 years within five-eighths of a mile of the filter. They have bought this land and built a road which has already saved them about $5,000 in the hauling.

Fig. 1 shows the completed top of the secondary filter with the manholes projecting. In the right middle part can be seen the rain gauge. Fig. 6 gives a good idea of

FIG. 9. FILTER, SHOWING PIERS AND CENTERING FOR ROOF

FIG. 8.—CONTRACTOR'S SCREENING AND LOADING PLANT

the work being done. On the left is a completed bed, not covered. In the right foreground the piers of another bed are shown, while in the distance is seen the completed secondary filter. Fig. 8 shows the screening and loading plant of the contractor.

All concrete was made of a mixture of 1:2½:4½. This made it possible to get a good face on the material of the walls. There were 7,000 cubic yards of concrete placed and 10,000 barrels of Edison portland cement used.

The placing of the sand is now going on, and it is hoped to put the filter in operation by January 1, 1908.

DUST LAYING TESTS

Tests with Oil in Chicago Parks—Good Results Obtained—Cost—Oil on Massachusetts Roads—Asphaltoilene—Dustoline—Calcium Chloride—Tarvia

DURING the past summer experiments have been conducted on the drives and boulevards of the West Chicago Park System, with an object of discovering, if possible, an effective and economical method of keeping the drives free from dust, dirt and mud, without doing any damage to the roadbed or crown; also to obtain an effective binder which will keep the surface from unraveling and minimize the cost of repairs. The general condition of the roadway surfaces treated was very good. The roadways consisted of limestone macadam and granite macadam, which were carefully prepared, before application of the oils, by being thoroughly cleaned and swept.

The materials used were: Soap and water, California asphaltum, fuel oil, and Kansas oil. The California asphaltum used was 98 per cent. pure and cost $30 a ton, or about 10 cents per gallon. The Kansas oil was of about 26° specific gravity and cost 3½ cents per gallon. Considerable difficulty was encountered in securing a soap which would work well with the water at hand. For the hard lime-water of Lake Michigan the "Tak-a-nap" brand, a soft naphtha soap manufactured by the Thayer & Hovey Soap Company, gave the best results. The first coat applied consisted of a 5 per cent. solution of the mixed California and Kansas oils, 75 per cent. Kansas oil and 25 per cent. California oil. The second coat consisted of a 10 per cent. solution, 75 per cent. California oil and 25 per cent. Kansas oil. The third coat consisted of a 10 per cent. solution of 75 per cent. Kansas oil and 25 per cent. California oil. These three applications followed each other about five hours apart. However, it was found that they were insufficient to hold the dust and that the percentages were not the best. The mixing was conducted on the principle that an oil broken up with an alkali will mix with water, and was as follows: Soft soap was mixed with alkali in as little water as was possible, which was agitated by pumping in and out of the tank until good suds were formed, and the oil was then pumped in. Following this, California liquid asphalt was introduced, the liquid being agitated continuously meantime. The tank was then filled with boiling water from another tank and the fluid, while boiling hot, was pumped into the sprinkler which conveyed it to the road and applied it before it cooled. The apparatus for mixing consisted of large tanks, a steam pump, water pipes and live steam pipes. A water pipe 1¼ inches in diameter was used for feeding into each tank; also a live-steam pipe projected nearly to the bottom of each. The circuit of the steam pump was provided with valves and connections so arranged that oil could be pumped from a tank outside the building into a tank inside the same, or directly into the sprinkling cart.

The approximate cost of carrying out the above operation for a period of two weeks did not exceed $60 for a given length of roadway, the cost of sprinkling which by water is approximately $70; or, in other words, a saving of at least 14 per cent. of the cost of sprinkling with water was effected by the use of oil, and the latter lays the dust much more effectively. This oil treatment was applied to roads constructed of different rock and different binding materials, and the experiments apparently showed that the less the binding material of any kind used the better were the results obtained. The most satisfactory results were found on old granite roadbeds whose top dressing had worn off some years ago and which was continuously complained of by automobilists and cyclists because of raveling; but that the better results were not due to the granite is shown by the fact that on limestone macadam roads whose surface had been worn off, the results have been even better than on the granite roads in the same condition. The experiments were not carried on so extensively on roads with gravel binding as on those with limestone binding, because the former do not make dust as rapidly as the latter and a light coating of oil keeps them in a fairly good condition for a long period; moreover, gravel binding has been used on roads which are traveled by about 75 per cent. less traffic than the others and consequently these are not comparable with those having limestone binding. Roads with too much limestone screenings in their construction ravel very quickly, even when oil is applied.

Experiments were made in oiling asphalt roads also, but one light sprinkling of oil kept the pavements in a dangerously slippery condition for a long time, and this is not recommended. It is inferred from the results of the experiments that a relationship exists between the alkalies in the soap and those of the carbonic acid in the limestone screenings. So far as physical action is con-

cerned, the oiling settles the dust, if it be light and the road clean, and binds the road together, making it very hard.

Similar experiments were begun in Lincoln Park, Chicago, in May of this year, where most of the roads are limestone macadam. Permanent results were considered secondary to dust-laying. Asphaltum oil, either pure or emulsified with soap and water, was used, but found to be too sticky. Finally a mixture of California asphaltum, Kansas fuel oil and soap was evolved. This emulsion does not become sticky but rolls down to a smooth surface under automobile traffic and penetrates into the road metal sufficiently to give a bond below the surface as well as on the surface where the dust particles combine with it. It gives the road a dark seal-brown color and emits no disagreeable odor. Traffic may continue unmolested while the oil is being applied and no bad results have been noticeable on rubber tires or on vegetation. In making the emulsion, 60 gallons of water are placed in two hogsheads, while a third is used for heating water for subsequent use. Live steam is then turned on and the water brought to a boiling point. Fifteen pounds of soap are then added and the water allowed to boil for five minutes longer, when 60 gallons of Kansas oil are added and the mixture is drawn from the bottom of one hogshead and through the steam pump back into the top of the second hogshead and through the agitating hose for about five minutes; half a barrel of California asphaltum is then added and the whole mixture allowed to emulsify for twenty minutes longer. Eight hundred gallons of this emulsion will cover approximately 4,000 square yards of road surface. Four or five applications are made in as rapid succession as practicable, detritus from the sides of the road being placed in any small holes, which subsequent applications of the oil cement down. Roads in Lincoln Park treated in this manner on June 19 remained in good condition until the middle of October without further treatment, when a limited amount of patching was found necessary, holes which appeared in the surface being cleaned out and filled with concrete formed of stone screenings and a hot mixture of the above oils. Meantime there has been no dust.

Several old roads in Chicago were resurfaced by adopting a modified form of the method of building oiled roads in California, known as the Santa Monica method. The old macadam was torn up with spiked rollers and a scarifier run over it until the metal was well broken up and leveled off, when the oil emulsion was applied until the stones were thoroughly wet; the road was then rolled with a heavy roller until oil and water appeared upon the surface, when the screenings were applied and it was again rolled until thoroughly packed. This work was carried on only in hot, dry weather. It cost about three-fourths of a cent per square yard, not including the work of regrading and resurfacing.

During the year the Metropolitan Park Commission of Massachusetts has been experimenting with the use of "Asphaltoilene" on roads in the Charles River and Revere Beach reservations and a few others. This material is a Kentucky oil with the naphtha and other volatile substances removed, leaving a heavy asphalt base, and was applied by means of a White oiler, a machine first used in California. It was found desirable to treat roads which were new or newly resurfaced. The cost for both material and application was six cents per square yard. On about one mile of Charles River road, which has a gravel top surface, an excessive amount of oil was used because of its unevenness, a light sprinkling of gravel being required in some places to absorb the surplus oil. Because of this excess of oil the road was closed for a week to allow proper penetration. This work was done in June, and the road has since been in excellent condition and required no watering or repairs; and it seems probable that the effect of the treatment will continue for another year if no injury is received from frost. On Revere Beach road about 1,700 square yards of new macadam was treated, but too little oil was used, especially at the sides, because of a desire to avoid marring the appearance of the concrete gutters and edge stones; consequently the road was not thoroughly bonded and began to ravel a little early in the fall, but was given another light treatment and is now in good condition. This oil gives no offensive odor but darkens the color, as might be expected because of the asphalt.

Asphaltoilene was used at a cost of six cents a square yard on Commonwealth avenue. The cost of spreading this by machinery was two and a half cents per square yard. A light coating of sand spread over the oil has been found to stop spattering. On a street in Newton the roadway was rolled with ¾-inch stone and this was covered with hot screenings mixed with twenty gallons of oil per cubic yard; the cost of this work, which was done last June, being twelve cents per square yard; and the street not having been watered since.

In Middlesex Falls Reservation about 140,000 square yards of roadway were treated with a mixture of Kentucky oil, similar to the above, and water-gas tar, the mixture being made in proportions varying from two barrels of oil to six of tar, to four barrels of oil to six of tar, the mixture being heated by a steam coil and applied while hot. This was found to keep the dust laid for eight or ten weeks, when another application becomes necessary. It has little if any binding qualities and therefore does not prevent raveling. The cost of material and application was about four cents per square yard, the oil costing 7½ cents per gallon and the tar 3½ cents. Experiments made by the United States Department of Agriculture with coal tar, water-gas tar, Tarvia, resin, salt and terra-colio indicated little choice between any of these, although possibly the mixture of coal and water-gas tar with resin and salt is preferable. Terra-colia is the name given to a certain emulsion of a crude oil preparation.

In the Boston parks the cost of oiling 30-foot roadways between April 15 and November 1 was $352.67 per mile, or two cents per square yard, the total amount of oil used between these dates being 1.49 pints per square yard. The cost of watering a 30-foot roadway a few years ago was

calculated to be $489 per mile in Franklin Park during 182 days, and $883 per mile on Commonwealth avenue for 230 days, water being applied whenever the dust appeared while the temperature was above 24° Fahr.

During the past summer the city engineer of Newport, R. I., has been making experiments with a dust layer called "Dustoline" and made by John S. Lamson, of Summit, N. J. This was applied to about five miles of roadway, most of it macadam. Two applications were made, about eight weeks apart, the heaviest first application made to any stretch being 0.18 gallons per square yard, while in some places this was but 0.13 gallons. The second application was practically 0.04 gallons per square yard on all roads. It is said to have answered the purpose of laying and keeping down the dust and more will probably be used as it is found necessary. It is not assumed that its effect will continue for any great length of time, as experience has shown that dampness tends to reduce its effectiveness. The material costs about 7½ cents per gallon at the point of loading, and the engineer states that by applying it by means of street sprinklers the cost of application is about one-half cent per gallon. The street inspector finds that it serves admirably to keep down the dust of those streets which are most traveled by automobiles, but that it has the distinct disadvantage of destroying the tires very rapidly, and is also injurious to clothing when thrown upon it by passing vehicles.

In this connection it is interesting to note that Newport uses both fresh and salt water for sprinkling its streets and the street inspector considers sea water superior to anything which he has used for laying dust, Dustoline included; the water on evaporating, leaving salts which form a sort of crust over the dust and for a considerable time after the water has evaporated prevent the particles from flying.

It is stated that the calcium chloride treatment has been found to be cheaper than sprinkling with clear water at Hingham, Mass., although this is best adapted to roads not subjected to rapid automobile travel. At Beverly Farms, Mass., there was treated during five months of last summer 9.69 miles of a 19-foot road traveled by heavy traffic at high speed, 692 automobiles and 490 other vehicles having been counted as passing in ten hours. The calcium chloride was applied by a patented method, by which a 600-gallon cart carries concentrated liquor to the street to be treated and discharges 100 gallons of this into each of six cans placed by the sides of the water standpipes; the cart then takes in 500 gallons of water and the contents of one can, and spreads this diluted liquid on the road, repeating the process with the contents of each of the other cans in turn. By this method the cart could cover an average of 3,800 square yards per load and spread 28 loads a day at 2.4 cents per square yard.

John R. Rablin, Engineer of the Metropolitan Park Commission of Boston, Mass., in a paper before the Massachusetts Highway Association (from the papers before which some of the above facts have been abstracted), stated concerning 3½ miles of park roadway in Revere, Chelsea and Everett, which were treated with Tarvia about a year ago, that during last winter about 2,000 feet of roadway showed signs of scaling, about one-quarter of an inch in thickness of the top surface breaking up and leaving the roadway in about its original condition. This he attributed to the fact that an excessive amount of binding material had been used in the construction of the road before the Tarvia was applied, which prevented the proper penetration of this material. In general, however, the roads remained in good condition throughout the winter and have been clean and free from dust or mud. In July other sections began to show wear, and about one-half of the road previously treated was re-treated with Tarvia and the other half patched where necessary, the average of re-treatment being 6.4 cents per square yard. Based upon the entire stretch of 3½ miles, the cost of maintenance, including re-treating and patching, was 3.5 cents per square yard. During the present year about 90,000 square yards of roadway have been treated with Tarvia at an average cost of 7.3 cents, the cost varying from 5.8 to 9.3. The cost of Tarvia treatment done by the Metropolitan Park Commission, including the various items of labor, tar, and stone, is shown in the following table:

COST OF TARVIA TREATMENT, METROPOLITAN PARK COMMISSION

Roadway	Work Done 1907	Total Cost	Sq Yds. Treated	Tar Used Gals.	Stone Used Tons	Cost per Square Yard				Tar per Sq. Yd.	Stone per Ton
						Labor	Tar	Stone	Total		
Middlesex Fells	Aug. 19–31	$1,403.74	15,000	8,846	234	$0.0318	$0.0383	$0.0234	$0.0935	.5897	.0156
Revere Beach Parkway	June 20–July 6	912.33	12,780	4,087	219.6	.0200	.0250	.0260	.0710	.3200	.0170
Revere Beach Parkway	July 6–Aug. 17	3,020.53	47,260	18,182	712	.0151	.0282	.0206	.0639	.3840	.0150
Winthrop Shore	Sept. 23–Oct. 12	1,635.95	23,500	10,845	256	.0215	.0324	.0157	.0696	.4615	.0109
Lynnway and Northern Circle	Sept. 16–21	736.55	8,840	4,710	189.5	.0185	.0376	.0272	.0833	.5300	.0214
Revere Beach Reservation	May 22–June 22	1,315.37	22,825	8,955	359	.0107	.0282	.0188	.0577	.4011	.0167
					Average cost,	$0.0196	$0.0316	$0.0219	$0.0731	.4477	.0161

Tarviating at Wayland, Mass., cost the Massachusetts Highway Commission eight cents per square yard. The Commission used two heating kettles, heating four or five barrels of tar at once, and was able to cover an average of 1,000 linear feet, or 2,000 square yards a day, with one gang. Mr. Pillsbury, Division Engineer of the Commission, advocated using larger kettles and regular machines for heating and spreading the tar, as in France; the securing of greater uniformity of tar by scientific inspection; and cleaner sweeping of the roads. He doubted the permanence of tar used in this way, and suggested increasing the depth of penetration, either by forcing it farther into the stone by compressed air when roads are first built or by placing a thicker coating of stone on top of the tar. He had not noticed any Tarvia roads become slippery. The roadway which he had found to stand automobile wear the best was bitulithic pavement, but he considered the cost of this too high.

STREET LIGHTING CONTRACTS

Both Gas and Electric Energy Becoming Less Expensive—Short-term Contracts Advised—Improvements in Gas and Electric Burners

By ALTON D. ADAMS,
Gas and Electric Expert, Worcester, Mass.

In the interest of cities and towns, contracts for street lighting should usually be made for not more than one year, and should be for gas or electric energy consumed in lamps of given types, rather than for the sale of light alone. Unless street lighting contracts are treated in this way, the public cannot expect to get a fair share of the reductions that are being made in the cost of light.

Gas lamps are increasing in efficiency and in the illuminating power of single units, recent types are better adapted to street service, and improved systems of distribution are being worked out that combine reduced cost of pipes with better control of lamps. The cost of gas itself is gradually sinking with improved methods of manufacture and larger outputs.

Electric transmissions from water power or from large generating plants are constantly being extended, and usually bring lower rates. Internal-combustion engines are at a stage of development that makes it possible to operate even a small electric plant with a high economy of fuel. Both arc and incandescent electric lamps have recently reached efficiencies in regular service that have not previously been practicable, and the indications are good for further advance on this line.

With such a state of facts, a long-term contract for street lighting, either at or slightly below the present rates, is quite sure to prove unprofitable to the city or town before the end is reached.

Apart from the desire of the lighting company to drive a shrewd bargain, there is small reason for five and ten-year lighting contracts. Cities and towns will remain, and will continue to want street lamps. True, in the absence of a contract, there may be an attempt at government regulation of the rates, but it is not to be assumed that such an attempt will be successful unless the rates are too high.

Private consumers are served, usually, without long-term contracts, and often with merely the obligation to pay for what they use from month to month. Why then should a city or town, whose demands for light are far more constant and certain than those of most private consumers, become bound to take the service at a certain price during a term of years?

Nothing in all this is intended as censure of the lighting companies. The officers of these companies are simply trying to make as much money as possible for the stockholders. Let public officials be equally zealous for the interests of the taxpayers.

Rates for electric street lighting should be based on the number of kilowatt-hours consumed, which depend on the type and efficiency of the lamps as well as on their candle-power and the hours of use. A contract for a term of years usually specifies lamps of a certain candle-power, or lamps of a certain type and make, and the city or town is not in a position to obtain more efficient lamps at a reduction in price, under such a contract. Illustrations are not lacking along this line, in both arc and incandescent street lighting.

During the past year, a type of arc lamps that operates with about 320 watts, but gives as much or more light than earlier types of arc lamps that require as much as 500 watts, has been substituted in some cases for these earlier types, with little or no reduction in rates, because the illuminating power alone was treated as the basis of the street lighting contracts. In other cases, the older and less efficient forms of arc lamps have remained in use under existing contracts, when the public might have had the advantage of improved lamps at lower rates, but for these contracts. For incandescent street lighting, the increase of lamp efficiency and the opportunity for reductions in rates are fully as great as those with arc lamps.

During some years, incandescent lamps that consume 3.5 watts per candle-power have been in general use for street lighting. Incandescent lamps that require only 2 watts per candle-power have now been available during some months for commercial lighting, and there is no good reason why lamps of this efficiency should not also be applied to street service.

For arc lighting, the above figures indicate a reduction of about 36 per cent., and for incandescent lighting a reduction of 42 per cent. in energy consumption for the same illumination. It may not be reasonable in any particular case to expect reductions that correspond to these percentages in the rates for street lighting, since minor parts of these rates are required to cover the renewals and care of lamps. On the other hand, it is highly unreasonable that cities and towns should obtain no reduction in the rates for street lighting through the use of these more efficient lamps. In some cities where the above high efficiency lamps have been introduced, the rates for electric energy have not been raised to private consumers, and they are therefore enjoying the entire benefit of the reduced energy consumption.

The above advances in the efficiencies of electric lamps are merely the earnest of more to come, some of which are known to be already on the way.

Gas street lighting offers as much reason as electric to forego the making of long contracts. At the start may be noted the peculiar fact that, in quite a number of cities, companies that own no franchise and operate no gas works hold the contracts for gas street lighting, and buy their gas from the local plants. Long-time contracts with such intermediate companies simply bind the city to pay two profits instead of one on its street lighting.

Improvements in gas street lamps are being made as rapidly as in the electric, but the actual use of the improved gas lamps on the streets has gone much further in Europe than in the United States. This latter fact is a strong reason against long contracts for gas street lighting, as the more efficient lamps now used in Europe will eventually be available here.

Upright incandescent burners with a single mantle

each, and operating at the ordinary pressures in the mains, are almost the only form of improved gas lamp in use for street lighting in the United States. Each of these burners is usually rated to consume 3 to 3½ feet of gas hourly, though this must vary with the pressure in the mains, and to give about 50 horizontal candle-power when the mantle is new. For such gas lamps it is not uncommon to find rates of $25 to $30 each per year of not more than 4,000 hours of lighting, in cities where the price of gas is not more than $1 per thousand feet. With a gas consumption of 3 feet per hour, the yearly cost of gas for one of these lamps, burning 4,000 hours, is thus $12, at $1 per thousand feet. The other $13 to $18 goes for care of the lamp, and for profits.

The horizontal direction of the strongest light rays of these incandescent gas lamps, and the small total candle-power of each, does not fit them for any great elevation above the street, and the efficiency of only 15 candle-power per cubic foot of gas per hour is capable of much improvement.

Intensified gas lamps, which are used in sizes up to 1,500 candle-power on English streets, raise the efficiency of gas to as much as 30 candle-power per cubic foot per hour, and compare favorably with electric arc lamps, where a high illumination is required. When lamps of this type are readily available in the United States, they will have a decided tendency to reduce the cost of street lighting.

A material factor in the case of street lighting with gas is the labor required to light and extinguish the lamps, when this is done by hand at each lamp. This method of operating the street lamps also has the disadvantage that some lamps are lighted too soon, and some are extinguished too late, as the attendant cannot reach all of the lamps at just the right time. A waste of gas thus results.

In England and other parts of Europe, automatic systems of lighting and extinguishing gas street lamps have been in use during several years, and a material saving of gas and labor is reported as a result. One English company reports a saving of 400 hours of lighting on each of 800 street lamps during the year, and with a gas consumption of 3 feet per hour at each burner, this saving would amount to 960,000 feet of gas on the 800 lamps, or to $960 at $1 per thousand feet.

Inverted gas lamps will soon find their way into the streets of American cities, and the better distribution with this type of lamps will tend to lower the cost of lighting per mile of streets. High-pressure distribution of gas in sparsely-settled districts now makes it practicable to lay long stretches of ¾-inch and 1-inch pipes where pipes of several inches diameter would be necessary on the low-pressure system, and this will have a tendency toward lower rates for street lighting in suburban districts.

There is promise, also, that high-pressure distribution will make it practicable to lay separate pipes for the supply of gas street lamps, and in this way control them from some central point.

Some small electric stations continue to operate today with steam power equipments that involve two to four times the fuel and labor cost per kilowatt-hour generated that would be necessary with internal-combustion engines. In such stations, the substitution of efficient equipment may be expected to lead to lower rates for street lighting service.

Essays on Municipal Government

THE National Municipal League has established an annual prize of $100, to be called the William H. Baldwin Prize, to be given to the author of the best essay on a subject connected with municipal government. For the year 1907-8 the competition will be limited to undergraduate students registered in a regular course in any college or university of the United States offering distinct instruction in municipal government. The prize will be awarded by judges selected by the Executive Comittee of the League, and the name of the winner will be announced at the next annual meeting. It was deemed wise to select a topic sufficiently general to enable each competitor to conduct investigations in the State and city with which he or she may be best acquainted, and the topic selected for the next year is "The Relation of the Municipality to the Transportation Service." This topic includes the street railways, the elevated and the underground, but does not include the urban service of steam railroads. Those entering the competition are expected to treat the following subdivisions:

1. Constitutional, statutory, charter and ordinance provisions regulating the granting of street railway franchises.
2. Historical sketch of the development of the street railway system. (It is suggested that competitors pay particular attention to the attitude of the public toward franchise grants during the early period of street railway development.)
3. Relation of the municipality to the street railway companies:
   - a. Terms of existing franchise grants.
   - b. Money payments from year to year:
     1. Payments in the nature of taxes.
     2. Payments in the nature of rental for streets.
   - c. Services other than money payments required of the companies, such as street paving, street cleaning, etc.
   - d. The finances of the street railway company or companies.
   - e. The process of consolidation of street railway companies (if such has taken place).
   - f. The present condition of the street railway service.
   - g. Suggestions for improvement of service.

Papers must not exceed 10,000 words in length and must be mailed or delivered to an express company not later than March 15, 1908, addressed to the "Chairman of the Committee of Judges, care Clinton Rogers Woodruff, Esq., Secretary of the National Municipal League, North American Building, Philadelphia, Pa.," and marked "for the William H. Baldwin Prize." Competitors will mark on each paper a *nom-de-plume* and enclose in a sealed envelope the full name, address, class and college corresponding to such *nom-de-plume*.

This prize has been awarded for two years past, the 1906 prize having been won by Arno Woods, of the University of Illinois, and the 1907 prize by Thomas A. Thatcher, of Yale, A. E. Pinanski, of Harvard, being given honorable mention.

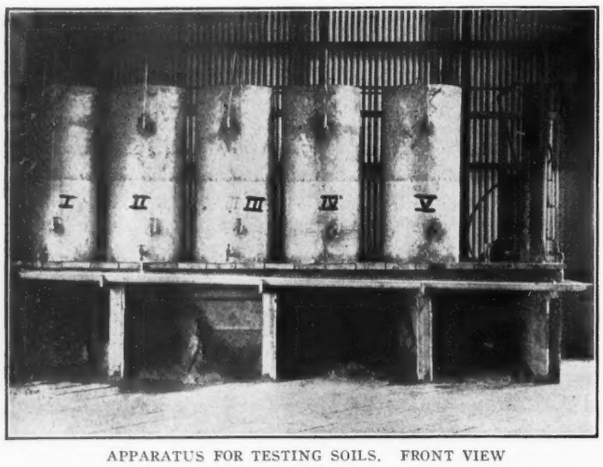
BALTIMORE'S SEWERAGE AND SEWAGE DISPOSAL

Natural and Artificial Filtration Both Found Impracticable—Tests of Available Soils—Improved Methods of Testing Described—Comparison of Results from New and Old Methods—Work Already Completed

THE designing and construction of the sewerage and sewage disposal systems for the city of Baltimore, Md., has involved the studying of several problems and the development of methods and technical information which are of great interest to municipal engineers and officials. One of these which has not, we believe, been generally appreciated is the reason for adopting sprinkling filters.

The method of sewage purification which seemed to offer the most satisfactory solution to the Board of Advisory Engineers, consisting of Messrs. Rudolph Hering, Samuel M. Gray and Frederic P. Stearns, was that of intermittent filtration through the apparently sandy soil of Anne Arundel County. Before finally deciding upon this method, however, it was determined to make a thorough test of the soil within a reasonable distance of the city. For this purpose 279 test-borings were made, covering a large area in Anne Arundel County. The borings were from five to ten feet deep and samples of the soil were taken wherever there was a change in the strata. A great many of these samples were mechanically analyzed by the Advisory Engineers. So much clay was mixed with most of the samples that they determined to make tests of the actual filtering capacities of the natural soils with their own force. At these places, where samples for these tests were taken, the top-soil was first removed and the soil secured for the tests was taken from just below the top-soil to a depth of 3½ feet.

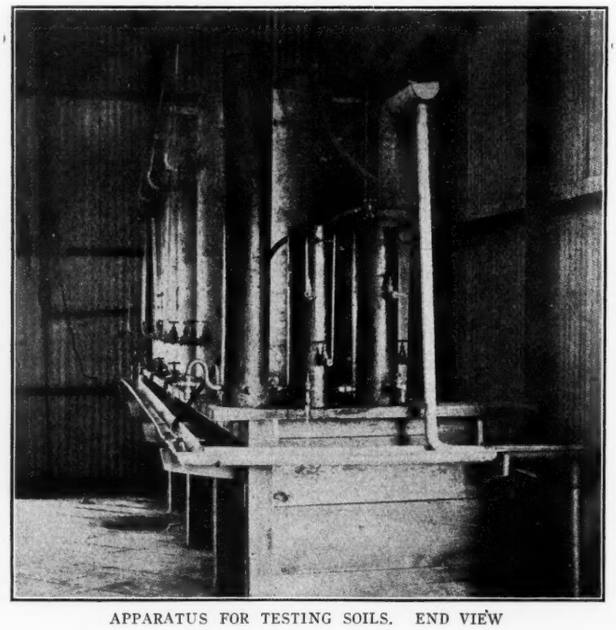
Tanks I and II contained washed samples from two sites; tank III unwashed soil from the third site; tank IV unwashed soil from the same site as tank I; and tank V unwashed soil from the same site as tank II. The soil was washed by filling a bucket two-thirds full of soil and then, with a slow stream from a hose, keeping it stirred up until the water passing off was free from particles discernible by the naked eye.



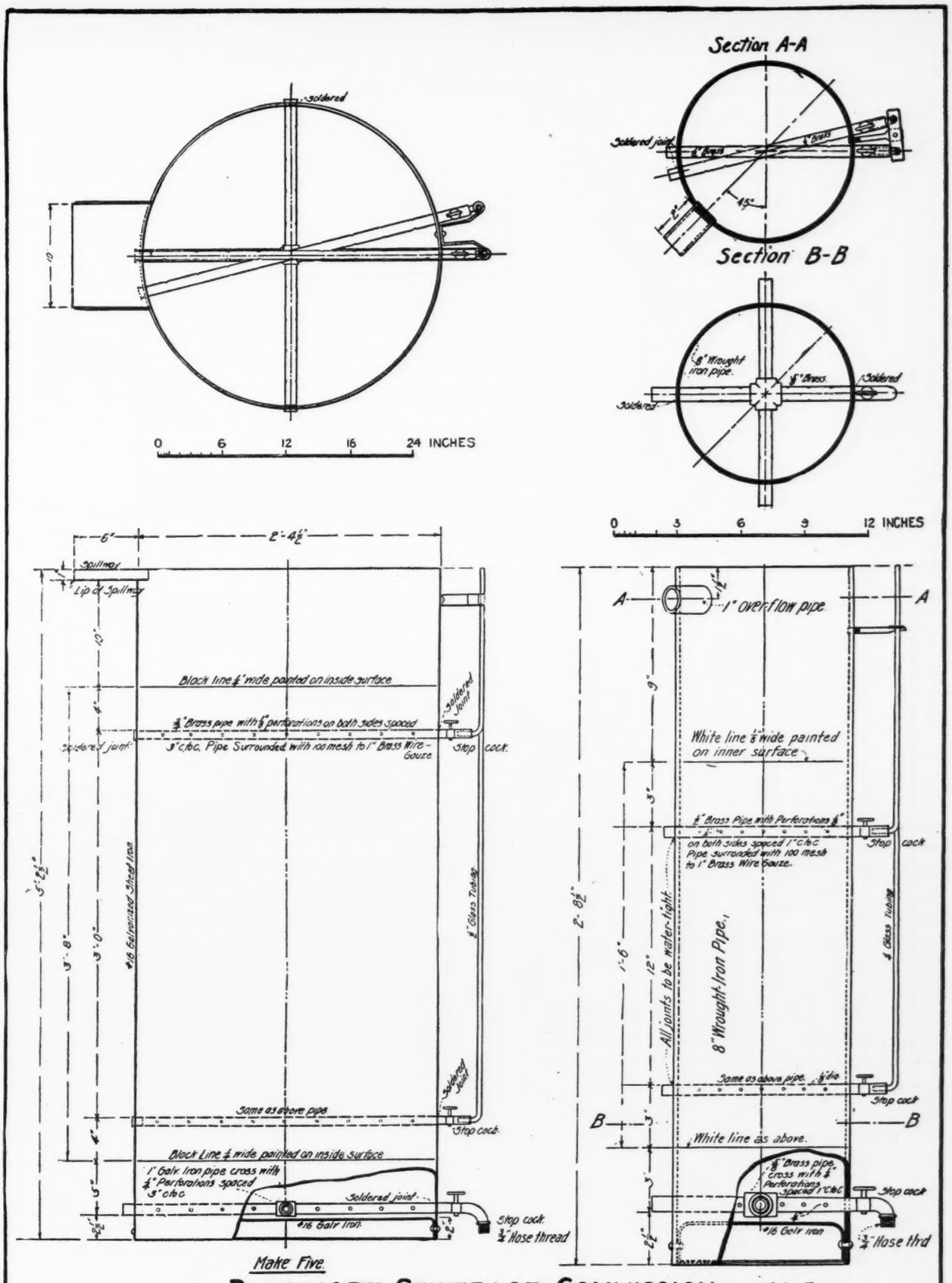
APPARATUS FOR TESTING SOILS. FRONT VIEW

The objects sought by these experiments were to obtain the rates, in gallons per acre per day, at which these soils will filter water, to ascertain the friction, or loss of head, of the water in passing through the soils, and to determine the amount of moisture held by capillary attraction within the soils at varying depths and after different periods of draining.

The apparatus designed for carrying out these tests was similar to the tanks used in testing the soils in the studies for the construction of the Bohio Dam. Five galvanized-iron tanks of watertight construction were made, each 5 feet high and 2 feet 4½ inches in diameter, giving a horizontal area of 0.0001 of an acre. In the bottom of each tank was placed a 1-inch galvanized-iron pipe cross, with ¼-inch perforations, spaced 3 inches center to center. One end of this cross was connected to a stop-cock. The cross was for the purpose of draining the tank. Over this drain was placed gravel, grading from that caught on a ½-inch sieve, which surrounded the pipe, to that which passed a ¼-inch screen and was caught on a ⅛-inch screen; the total depth of the gravel was 5 inches. Upon this layer of gravel the material to be tested was placed to a depth of 3 feet 8 inches. Within this material, 4 inches above its bottom and 4 inches below its surface, were placed horizontal, perforated brass pipes covered with brass wire gauze, 100 mesh to the inch. These pipes were ¾-inch in diameter and the perforations were ⅛-inch in diameter and spaced 3 inches apart. The ends of these pipes and also of the drain pipes in the bottom of the tank passed through the sides of the tank and were closed with rubber stoppers. The object of these stoppers was to allow clearing the pipes readily of all dirt which might make its way into them. The brass pipes were connected to vertical glass tubes.



APPARATUS FOR TESTING SOILS. END VIEW


Section A-A
Section B-B
Soldered
0 6 12 18 24 INCHES
0 3 6 9 12 INCHES
Spillway
Lip of Spillway
Block line ¼" wide painted on inside surface
¾" Brass pipe with ⅛" perforations on both sides spaced 3" c/to c. Pipe Surrounded with 100 mesh to 1" Brass Wire Gauze
Stop cock
#16 Galvanized Sheet Iron
¾" Glass Tubing
Same as above pipe
Block Line ¼ wide painted on inside surface
1" Galv. Iron pipe cross with ¼" Perforations spaced 3" c/to c
Soldered joint
#16 Galv Iron
Stop cock
½" Hose thread
Make Five
1" over-flow pipe
White line ⅛ wide painted on inner surface
¾" Brass Pipe with Perforations ⅛" on both sides spaced 1" c/to c Pipe surrounded with 100 mesh to 1" Brass Wire Gauze.
All joints to be water-tight
8" Wrought-Iron Pipe.
Same as above pipe
White line as above.
¾" Brass pipe cross with ¼" Perforations spaced 1" c/to c
½" Hose thrd
Make Two.

BALTIMORE SEWERAGE COMMISSION

Apparatus for testing the Friction of Water in passing through Sands and Soils

TESTS OF SOILS FROM ANNE ARUNDEL COUNTY, BY OLD AND NEW METHODS

	Washed. Tank I	Washed. Tank II	Natural. Tank III	Natural. Tank IV	Natural. Tank V
Effective size, m. m.—old method	.308	.233	.244	.205	.187
Effective size, m. m.—new method	.322	.231	.075	.033	.162
Uniformity coefficient—old method	1.77	2.49	1.6	1.9	1.9
Uniformity coefficient—new method	1.69	2.51	5.0	11.5	2.17
Per cent. dust (mechanical analysis)—old method	.932	.59	2.20	4.78	4.15
Per cent. dust (mechanical analysis)—new method	1.24	1.03	13.94	21.36	6.62
Per cent. dust (elutriation)	2.01	.92	11.50	19.33	6.21
Specific gravity (whole)	1.54	1.50	1.68	1.73	1.57
Specific gravity (particles)	2.64	2.63	2.55	2.62	2.59
Per cent. voids (by specific gravity)	41.2	43.1	34.2	34.4	39.4
Per cent. voids (packed dry)	41.4	43.1	34.1	34.1	39.6
Per cent. voids (wet soil)	39.7	40.7	40.4	40.8	41.2
Rate of filtration (gallons per acre per day)	27,450,000	25,203,400	247,000	35,630	312,822
Velocity (meters per day) (v)	25.6	23.5	.24	.033	.29
Loss of head (h)	22.5	31.19	44.23	48.65	47.06
Depth of filtering material (l)	36	36	36	36	36
Temperature, Fahr. (t)	57	60	55.46	55.46	55.46
Value of C (Hazen's Formula)	353.83	435.75	31.8	2.05	7.78

The water to be filtered was applied during the day and turned off at night in order to secure an action which would be similar in result to the intermittent application of sewage to the same soil. The water was applied in such a manner that a constant head of 10 inches over the perforations were 1/8-inch in diameter and the surface of the soil was obtained, the surplus water passing off by an overflow.

When the experiments were in progress the water appeared in the glass tubes and rose in each of them to a height due to the pressure of the water in the filtering material immediately surrounding the perforated brass pipe to which the glass tube was attached. The difference in the height of water in the tubes showed the amount of head lost in the filtering material by the water in passing from the upper tube to the lower tube. When it was desired to filter with a smaller loss of head than was secured by a free outlet at the bottom of the tank, the stop-cock connected to the underdrain was partially closed, which caused the water in the glass tube connected to the lower brass pipe to rise and decrease the loss of head.

In order to determine the amount of moisture which would be retained in the different soils by the capillary attraction of the sand grains, a sixth tank was constructed, of wrought-iron pipe, of the same depth as the others previously described, but only 8 inches in diameter. In the bottom of this tank was placed a galvanized-iron pipe cross, perforated similarly to those in the larger tanks. The stop-cock through which this tank drained was connected to the cross by means of a goose-neck with a vertical rise of 5 inches, which kept the tank from draining absolutely dry. The bottom of the tank was filled with gravel to the same depth and in a manner similar to that described for the larger tanks. The material to be tested was then filled in upon this gravel to within 7 inches of the top of the tank. Openings at distances of 6, 18, 30, 39 and 45 inches below the top of the material were provided in order to be able to obtain samples of the material at these depths. These openings were closed, except when obtaining samples of soil.

In order to drive out the air from the interstices of the material within the tank, it was filled from the bottom very slowly; if filled too rapidly the water would work its way along the side of the tank and appear at the top without diffusing through the material. After being filled the tank was allowed to drain and measurements were made hourly to determine the rate at which the sand drained. Then at periods of 24, 48 and 96 hours from the time when the tank began to drain, samples of soil were taken from the openings already described. The lowest of these five openings was designated "A," and so on in alphabetical order to the top one, "E."

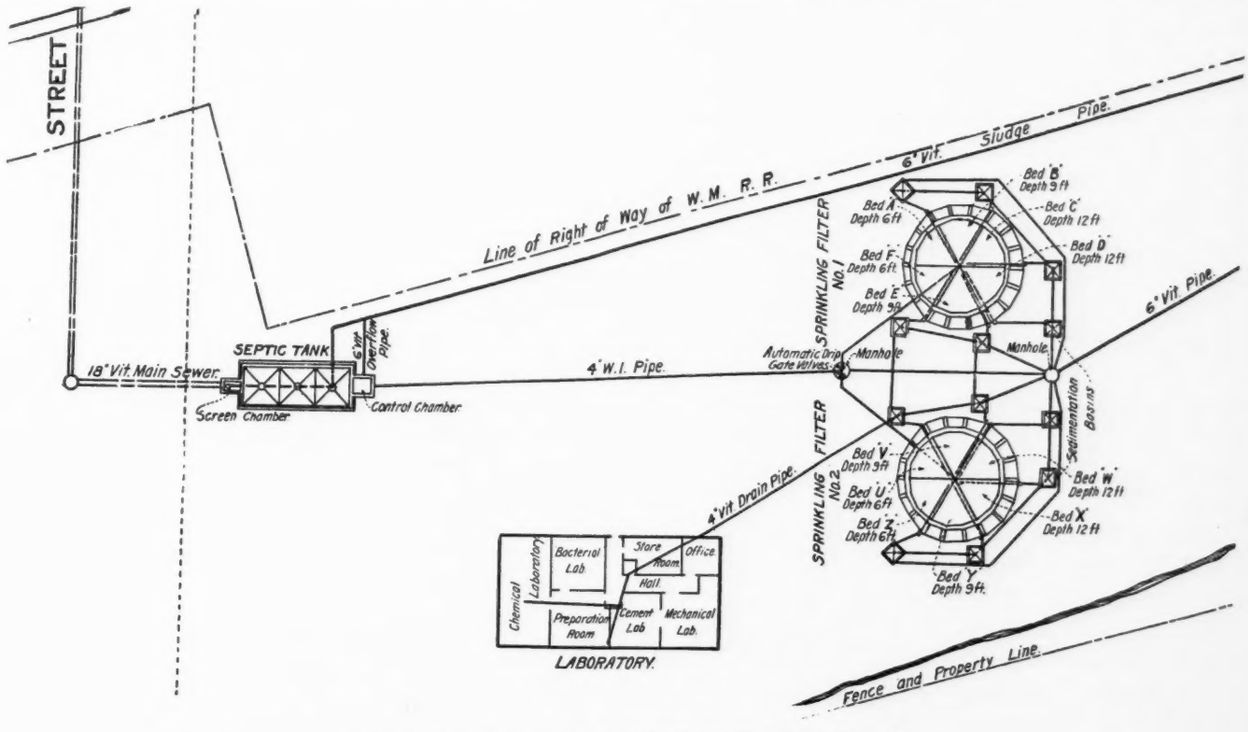
In order to secure results on the moisture determinations within a shorter period than would be possible by operating tank VI alone, tanks I, II, III, IV and V were operated in the same manner as VI, the samples used being secured from the various depths, when possible, by means of a 2-inch auger. These samples were carried about a quarter of a mile to the power-house, where they were weighed, then dried in an oven at 100 degrees Centigrade, and then weighed again. The weight of the moisture driven off was then computed in per cent. of the dried soil.

The table shows the results obtained from a series of tests of washed and unwashed soils. The last six items in the column headed Tank I refer to but one of seven tests, and those under Tank II one of eight tests; each being an approximate average of all the tests in that tank. In making mechanical analyses by the old methods, i. e., passing it through a series of screens placed one above the other, it was found that 1,200 shakes did not make the dust and fine clay particles pass through the finer sieves, only a very small quantity passing the last three or four sieves; this fine material clinging very tenaciously to the larger particles and to the wire of the screens. In order to check up the amount of finer particles held on the screens above the finest screen, in addition to working out the percentage by weight of the soil passing through all the screens, the percentage of the soil passing through the finest screen alone was worked out.

FILTERS AND LABORATORY OF SEWAGE DISPOSAL TESTING PLANT

The wide difference in these results shows the inaccuracy of the present method of making mechanical analysis of sands which contain large quantities of fine clayey material. For clean sands containing small amounts of clay the present practice is sufficiently accurate; but for those containing large quantities of clay it is necessary, to obtain accurate results, to place all the sand upon the finest screen alone and give 800 shakes; the sand remaining on this screen should then be placed on the next finest and given 800 shakes; and this operation continued until it has been placed on the coarsest screen, when all the screens should be nested and the whole given 1,200 shakes. The differences in the results obtained by these two methods are shown in the table under the titles of "Old Method" and "New Method." It is seen that in the case of the washed sands the difference between these methods is not very great, but with the natural or unwashed it amounts to several hundred per cent.

As a result of tests of the available soils, the idea of intermittent filtration was abandoned as being impracticable, on account of the large amount of dust contained and the low effective size; although results obtained by the ordinary methods of analysis would have indicated the contrary to be the case. The use of artificially constructed sand beds of selected sand was considered and looked into quite thoroughly. The amount of sand required would be between 6,000,000 and 7,000,000 cubic yards. Investigation of the areas in proximity to the city developed the fact that deposits of pure sand in Anne Arundel County occurred only in small isolated areas, the greater part of the soil which was apparently sand containing large percentages of clay. Most of these deposits were controlled by private companies which hold the sand for building purposes, and an estimate based upon careful investigation of all the pure sand both above and under water in these deposits gave the total of all as 4,700,000 cubic yards. Some deposits were found in Baltimore County, but these were covered with such thick layers of loam or clay that they could not be worked economically. These near localities proving incapable of furnishing sand, estimates of obtaining it from a distance showed that the expense of this method would be excessive, and as a third choice the Advisory Engineers decided to recommend a system of purification consisting of treatment in septic tanks followed by sprinkling over filter beds of broken stone, and by a final purification by intermittent filtration through artificial sand filters. It was believed that the sewage after passing through the septic tanks, sprinkling filters and sedimentation basins, but before filtration in the sand filters, would have been deprived of approximately 95 per cent.



BALTIMORE SEWAGE DISPOSAL TESTING PLANT—GENERAL PLAN

of its organic impurities and of its bacteria. The Commission thought that this purification should be sufficient, being probably purer than the water of Back River, into which it would be discharged; in which case the great expense involved by the sand filters could just as well be saved. But the Legislature had required the construction of these sand filters and their construction was therefore not optional with the Commission. In order to convince the Legislature that these filters would be unnecessary and that they should be relieved of the burden of their construction, the Commission decided to establish a testing station which should be a miniature counterpart of the ultimate disposal plant. The sewage of a certain portion of the city was therefore led to such a testing plant and this plant has now been in operation for some time. In connection with the plant a chemical and bacterial laboratory is operated which, in addition to the oversight of the purification plant, also tests cement and conducts other investigations for the Commission. The plan shows the general arrangement of this purification plant and in the photograph may be seen the filters with their several depths of filtering material. This plant cost about $10,000, and is claimed to have shown that, without the use of sand filters, 98 per cent of the bacteria are removed.

Interesting investigations were made concerning the effect upon bacterial treatment of sewage of different kinds of waste which are discharged therein. Wool scouring and cloth washing wastes contain large quantities of organic and fibrous matters, which make nitrification difficult and clog a filter. Pulp or paper mill wastes also contain much fibrous and cellulose matters, which are acted upon but slowly by septic action and form large quantities of sludge, also clogging the surface of the filter. Slaughter-house wastes are excessively strong and offensive and contain large quantities of fibrous and cellulose matters which cause the formation of a very thick skum in a septic tank and the rapid clogging of all classes of filters. Creamery wastes are very offensive and if undiluted are difficult to purify. Experiments with the slaughter-house wastes from two of the principal packing-houses in the United States showed that such wastes contain from six to ten times as much putrescible organic matter as is contained in ordinary city sewage. At these packing-houses it was impossible to secure a nitrified or non-putrefactive effluent of these undiluted wastes, although experiments were tried with septic tanks, with the period of detention varying from four to one hundred hours, and this septicised effluent treated with single-contact, double-contact, Scott-Moncreif's system of filtration through six trays of sand nine inches deep, and single-contact followed by sand filtration.

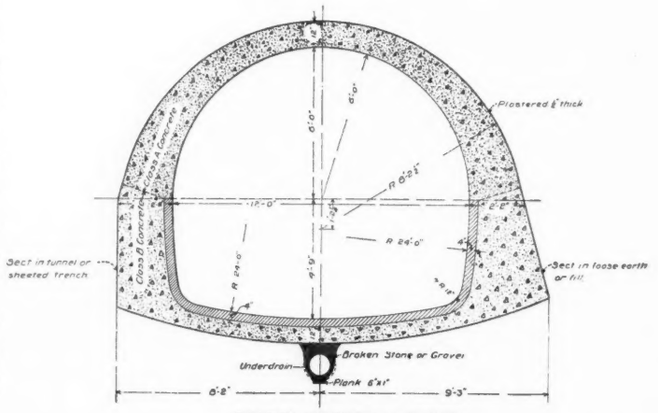
The average analysis of slaughter-house wastes made in the chemical laboratories of the packing-houses, as compared with city sewage, is shown in the following table:

	Total Solids	Chlorine	Free Ammonia	Alb. Ammonia	Oxygen Absorbed
Slaughter house wastes.....	7,090	1,792	173	56.1	311
City sewage.....	700	120	51	9.5	51

The addition of these 500,000 gallons of slaughter-house wastes per day to the city sewage will have approximately the same effect as the addition of 4,000,000 to 5,000,000 gallons of domestic sewage. In the septic tanks they will add large quantities of cellulose and fibrous matter which will resist liquefaction and increase the scum on the tanks.

The principal objection to brewery wastes comes from the sulphuric acid used in washing the kegs and bottles. The water used for washing kegs and bottles contains sulphuric acid, yeast, ashes and bisulphate of lime. The fact that in Brooklyn, N. Y., the invert of a small concrete sewer carrying off the waste from a brewery was entirely eaten away in about five years would indicate that these wastes contain considerable acid. The objectionable feature of distillery waste is the lactic acid from the fermentation vats.

Real construction work on the sewer system was begun October 24, 1906, and the anniversary of this was celebrated by carrying a party on a tour of inspection to the large disposal plant on Back River, the testing plant and laboratory above described, and the work of sewer construction throughout the city. During this year twenty-three contracts have been let for a total amount of $2,981,096, and more than 15½ miles of drains and sewers have been completed, as stated in our columns for November 20. The work when completed will include a storm water system; a house sewerage system, divided into two parts, one of which will carry sewage from the higher parts of the city by gravity to the disposal plant and the other will collect sewage from the lower areas which must be pumped; the construction of an outfall sewer to carry all the sewage to the disposal plant on Back River; and the construction of this disposal plant, covering 429 acres of ground.



SECTION OF OUTFALL SEWER.

MUNICIPAL BOND SALES

Data Concerning Sales of Municipal Bonds During October by Cities of Less than 100,000 Population—Financial Statistics of Cities Listed

Name of City	Estimated Population	Actual Value of Assessable Property (estimated)		Ratio of ass't to actu'l v'lue	Bonded Debt	Sinking Fund	Net Bonded Debt		Tax Rate per $1,000 Ass'd Value	Bond Sales, Oct., 1907				Basis
		Total	Per Capita				Total	Per Capita		Term of Years	Amount	Interest	Price	
Oroville, Cal.										1-40 ser.	$66,813	5 % s.a.	Par	
Torrington, Conn.										20	75,000	4½% s.a.	101.20	4.484
Coeur d' Alene, Ida.										10-20 opt.	40,000	6 %	103.10	5.693
Hillsboro, Ill.										5-10 opt.	1,000	6 %	Par	
Hammond, Ind.										8 mos.	13,000	6 %	Par	
Jasper, Ind.										2-8 ser.	7,000	3½%	Par	
Terre Haute, Ind.										10-20 opt.	100,000	4 % s.a.	100.70	3.914
Arkansas City, Kan.	8,116	$4,028,055	$496	.25	$255,000	$7,530	$247,470	$30.61	$81.00	20	18,000	4½%	Par	
										10	12,500	4 % s.a.	95.10	4.61
Clay Center, Kan.	4,000	461,000	115	.50	94,000		94,000	23.50	67.00	10	7,500	4 % s.a.	94.08	4.75
										10	5,000	4 % s.a.	93.00	4.89
Holton, Kan.										30	25,000	4½%	Par	
Hutchinson, Kan.	15,000	12,000,000	800	.20	180,000		180,000	12.00	70.00	1-10 ser.	48,506	5 %	Par	
Leavenworth, Kan.										1-8 ser.	4,532	5 %	Par	
Wichita, Kan.	40,000	25,602,190	640	.30	1,166,882	None	1,166,882	29.17	59.00	1-10 ser.	52,299	5 %	Par	
Tensas Parish, La.										10-20 opt.	30,000	5 %	Par	
Auburn, Maine	14,000	9,500,000	678	.66	317,200		317,200	22.65	20.00	20	25,000	4 %	Par	
Chelsea, Mass.	38,659	26,411,500	683	100%	899,500	633,483	266,017	6.88	20.80	1-5 ser.	115,000	5 % s.a.	100.317	4.863
Milford, Mass.										1	45,000	5½% s.a.	100.55	4.93
Salem, Mass.										10 avg.	100,000	4½% s.a.	102.15	4.234
Springfield, Mass.	77,500	86,610,281	1,117	100%	2,542,900	435,449	2,107,451	27.19	15.00	1-20 ser.	170,000	4 %	Par	
Waltham, Mass.	27,000	24,956,188	924	100%	1,378,000	590,855	787,145	20.14	16.70	1-15 ser.	15,000	4½% s.a.	101.389	4.293
Bay City, Mich.										4½ avg.	150,000	5 % s.a.	Par	
Pontiac, Mich.	12,000	8,000,000	667	.75	223,000	6,417	216,583	18.05	21.00		25,000	5 % s.a.	102.276	
											10,000	5 % s.a.	101.735	
											17,000	5 %	100.05	
Port Huron, Mich.											1,000	5 %	101.50	
											1,000	5 %	101.00	
											1,000	5 %	Par	
Saginaw, Mich.	60,000	36,000,000	600	.67	2,004,503	42,000	2,052,503	34.21	13.35	1-10 ser.	10,000	4 % s.a.	Par	
Mankato, Minn.	12,000	12,000,000	1,000	.40	196,000	4,000	192,000	16.00	32.60		25,000	4 %	Par	
Brookhaven, Miss.										4⅝-10⅜ opt.	15,000	6 % s.a.	Par	
Canton, Miss.	5,000	2,200,000	440		56,000		56,000	11.20	13.00	19¼-20 opt. avg.	50,000	5 % s.a.	95.50	5.369
Eupora, Miss.	1,500	230,000	153	.75	15,000	None	15,000	10.00	11.50	20	10,000	6 % s.a.	Par	
Magnolia, Miss.										20	25,000	5 % s.a.	103.004	4.765
California, Mo.	2,300	4,000,000	1,730	.25	5,000		5,000	2.17	6.00	10-20 opt.	50,000	5 %	100.01	4.999
Falls City, Neb.	5,000	3,000,000	600	.20	30,000		30,000	6.00	37.50	10	5,000	5 %	Par	
South Omaha, Neb.	37,640	50,000,000	1,281	.44	976,000	None	976,000	25.92	82.00	5-20 opt.	48,000	5 % s.a.	Par	
Plainfield, N. J.	19,100	21,500,000	1,125		300,000	None	300,000	15.70	13.50	17 1-6 avg.	68,000	4½% s.a.	100.04	4.496
Union Hill, N. J.										5-6 ser.	5,000	4½%	Par	
Binghamton, N. Y.	45,000	23,284,660	517	.80	769,500		769,500	17.10	17.00	3 1-6 avg.	25,000	4 % s.a.	Par	
										11 avg.	40,000	4 % s.a.	Par	
Corning, N. Y.	15,000	7,000,000	467		209,094		209,094	19.09	21.86	16½ avg.	75,000	4 % s.a.	Par	
Hamburg, N. Y.										1-5 ser.	2,500	5 %	Par	
Kenmore, N. Y.	1,000	1,800,000	1,800	.60	94,600	4,000	90,600	90.60	6.62	1-30 ser.	42,660	5 % s.a.	100.005	4.999
New Rochelle, N. Y.	27,000	24,000,000	889		1,772,017		1,772,017	65.63	24.62	1-5 opt.	20,000	6 % s.a.	100.086	5.91
										1-5 opt.	23,000	6 % s.a.	100.108	5.887
											500	4½% s.a.	107.00	
											1,000	4½% s.a.	105.00	
											500	4½% s.a.	104.16	
											2,000	4½% s.a.	103.62	
Owego, N. Y.	5,300	3,045,055	574	.90	53,000	None	53,000	10.00	13.45		1,000	4½% s.a.	103.50	
											1,500	4½% s.a.	102.00	
											500	4½% s.a.	102.00	
											3,500	4½% s.a.	101.54	
											4,500	4½% s.a.	101.25	
Pelham Manor, N. Y.										5-12 ser.	8,000	5 %	100.062	4.991
Philadelphia, N. Y.	1,000	400,000	400	.94	37,700		37,700	37.70	8.50	5-16 ser.	6,000	5 %	100.166	4.979
Thompson, N. Y.											6,000	5 %	Par	
Troy, N. Y.	76,000	54,250,172	714	100%	3,541,679	85,779	3,455,900	45.47	17.66	1-20 ser.	130,048	4½% s.a.	100.588	4.429
Utica, N. Y.	70,000	37,000,000	528	100%	1,300,000		1,300,000	1.85	9.80	10-19 ser.	8,000	4 % s.a.	Par	
White Plains, N. Y.	14,500				1,307,060		1,307,060	96.35	10.51	10	15,000	5 % s.a.	101.25	4.84
Yonkers, N. Y.	68,900	60,019,750	883		5,018,682	299,600	4,719,082	69.40	24.48	2½	240,000	5½% s.a.	100.80	5.331
										50 avg.	100,000	4½% s.a.	105.561	4.242
Winston-Salem, N. C.										30 avg.	150,000	5 %	100.25	4.984
Akron, Ohio.	50,000	40,000,000	800	.75	1,280,095		1,280,095	25.62	32.00	4 avg.	14,200	4½%	100.57	4.343
										1-5 ser.	3,950	5 %	100.506	4.816
										1-3 ser.	750	5 %	100.70	4.631
Ansonia, Ohio										2½ avg.	1,600	5 % s.a.	100.312	4.865
Batavia, Ohio	1,200	800,000	666	.45	41,260		41,260	34.38	37.00		4,038	4½%	100.24	
											448	4½%	Par	
Chagrin Falls, Ohio										13½ avg.	18,000	5 % s.a.	104.05	4.501
										1-10 ser.	42,500	5 % s.a.	100.083	4.795
Cleves, Ohio										10	2,500	5 % s.a.	102.52	4.681
										5⅞ avg.	5,630	4½% s.a.	100.609	4.373
Fremont, Ohio.										5½ avg.	2,032	4 % s.a.	100.40	4.40
										5 1-6 avg.	803	4½%	100.56	4.39
Girard, Ohio.										2-5 ser.	2,000	5 % s.a.	101.30	4.503
Greenwich, Ohio.										1-10 ser.	8,000	5 % s.a.	102.237	4.533
										1-10 ser.	4,700	5 % s.a.	102.638	4.453
Hamilton, Ohio.	30,000	22,000,000	733	.50	1,064,505	54,684	1,009,821	33.66		1-10 ser.	12,075	4½% s.a.	100.414	4.413
Lima, Ohio.	35,000	10,601,443	302	.60	853,000	260,198	574,812	16.42	38.00	1-10 ser.	8,302	5 %	Par	
Milford Center, Ohio										6 1-6 avg.	19,700	5 % s.a.	100.606	4.865
Mt. Washington, O.										1-10 ser.	788	5 %	100.126	4.973
Norwood, Ohio.										30	34,000	4 % s.a.	100.264	3.985
										1-10 ser.	3,654	4½% s.a.	Par	
Pleasant Ridge, O.										5	1,576	5 % s.a.	100.317	4.927
Quincy, Ohio.										2⅝ avg.	1,563	6 % s.a.	101.055	5.227
Shiloh, Ohio.	800	400,000	500	.48	None	None			29.50	1-10 ser.	6,600	4½% s.a.	100.151	4.464
										1-2 ser.	6,600	4½% s.a.	100.151	4.464
Springfield, Ohio.	48,000	35,000,000	720	.20	1,014,827		1,014,827	21.14	27.30	20½	5,000	4 % s.a.	Par	
Struthers, Ohio.										1-22 ser.	10,000	5 % s.a.	104.21	4.554
Troy, Ohio.										14¾ avg.	28,000	4 % s.a.	Par	
Van Wert, Ohio.	8,200	8,000,000	975	.30	165,300	304	164,996	20.12		5	6,500	4 % s.a.	Par	
										5 1-6 avg.	16,000	4 %		
Wooster, Ohio.										5½ avg.	3,100	4 %	100.402	4.22
										3 avg.	2,250	4 %		
										5 avg.	3,500	4½%		

MUNICIPAL BOND SALES—*Continued*

Name of City	Estimated Population	Actual Value of Assessable Property (estimated) Total	Per Capita	Ratio of ass'd to actu'l v'lue	Bonded Debt	Sinking Fund	Net Bonded Debt Total	Per Capita	Tax Rate per $1,000 Ass'd Value	Bond Sales, Oct., 1907 Term of Years	Amount	Interest	Price	Basis
										6¾ avg.	$26,000	5 % s.a.	102.373	4.583
										2-6 ser.	15,000	5 % s.a.	101.073	4.70
										2-6 ser.	1,470	5 % s.a.	100.884	4.754
Youngstown, Ohio..	60,483	$56,882,000	$940	.50	$1,269,112	$209,167	$1,059,945	$17.25	$20.42	2-6 ser.	2,530	5 % s.a.	100.375	4.874
										1	650	5 % s.a.	100.153	4.841
										2-3 ser.	2,000	5 % s.a.	100.90	4.613
										1	725	5 % s.a.	100.136	4.86
										2-6 ser.	1,485	5 % s.a.	100.202	4.943
Fairview, Okla.										30	50,000	6 % s.a.	100.10	5.993
Hobart, Okla.										30	65,000	6 %	Par	
Pawhuska, Okla.	3,000	1,000,000	333	.33	32,000	None	32,000	10.67		30	106,000	6 %	Par	
Pawnee Okla.	2,000	1,020,000	510	.33⅓		1,500			20.00	30	20,000	6 %	100.05	5.998
Claysville, Pa.											5,700	5 %	Par	
Denver, Pa.										10-30 opt.	2,500	4 % s.a	100.80	3.902
Doylestown, Pa.											12,100	4 %	101.822	
Harrisburg, Pa.	75,000	40,000,000	533	.60	1,605,600	433,308	1,172,292	15.63	9.00	13½ avg.	400,000	4 % s.a.	Par	
Sheraden, Pa.										30	85,000	3 %	101.294	4.015
Brownsville, Tex.										20-40 opt.	53,000	5 % s.a.	101.188	4.906
Goldthwaite, Tex.										5-40 opt.	5,000	5 %	Par	
Green Bay, Wis.										5¼ avg.	17,000	4½ %	Par	
										10 1-6 avg.	32,000	4½ %	Par	
Manitowoc, Wis.										13-15 ser.	15,000	4 % s.a.	100.66	3.938
Platteville, Wis.	5,200	3,819,916	734	.75	46,000	12,000	34,000	6.53	8.40	20	20,000	4½ % s.a.	Par	
Franklin, W. Va.										10-33½ opt.	3,000	6 %	100.33	5.956
										10-33½ opt.	500	6 %	100.00	
Hinton, W. Va.										32	25,000	6 %	105.60	5.626
Pennsboro, W. Va.										10-20 ont.	12,000	6 % s.a.	100.62	5.918
Union. W. Va.										15-25 ser.	5,500	6 %	Par	

BEAUTIFYING OF CITIES

Report of the Committee on Municipal Improvement of the American Institute of Architects—Comprehensive Plans Adopted in Several Cities

By T. M. CLARK, Chairman

Your Committee cannot report any very extensive movement during the year in the way of municipal improvements throughout the country, but such progress as has been made is of a gratifying character, indicating that the value of the training of architects in qualifying them to solve the problems connected with the convenience, beauty and healthfulness of cities is now recognized in this country as it has never been before.

While preliminary plans have been made during the year for improvements in a considerable number of cities, including many of the smaller communities, as well as most of the large ones, comparatively little progress has been made in carrying them out; but it is satisfactory to observe that this has been due to lack of means, rather than failure to appreciate the value of the suggestions made, and that, so far as any work has actually been done, it has been carried out in conformity with the plans. In Cincinnati, for example, the municipal government, urged by the intelligent and persistent efforts of the Cincinnati Chapter of the Institute, has had a comprehensive plan for improvement prepared by Mr. Kessler, of Kansas City, and it is proposed to carry out this plan as opportunity may offer, while in Buffalo and Pittsburg influential associations of citizens support the plans prepared and approved by the local architects. It is hardly necessary to point out the difference between this way of treating the suggestions of experts and the contemptuous disregard of their advice which was the fashion among public officials a few years ago. Similarly, in Washington, the plan of the Burnham Commission, after many anxieties, has been practically adopted by the authorities, and it is unlikely that any serious attempt will now be made to spoil it; while the Cleveland scheme, which has been in the hands of architects from the start, is now well advanced in execution.

Your Committee has thought it desirable to volunteer its assistance in two interesting cases, and has been pleased with the manner in which its efforts were received. It will be remembered that an effort was made last winter in California to have the capital of the State transferred from Sacramento, the present capital, to Berkeley, the seat of the State University, and a city of great and increasing importance; and at the same time, a movement was started for the development of the commercial facilities of Berkeley, whose natural advantages as a seaport rival those of San Francisco. In view of the magnificent plan, by M. Berard, adopted for the group of buildings for the University of California, forming the principal feature of the city, it seemed to your Committee that it would be most unfortunate to leave to chance the disposition of the remaining portions of the new municipality which the contemplated political and commercial changes would create. . . . A somewhat similar suggestion was made, through Mr. John Calvin Stevens, Fellow of the Institute, in the case of Portland, Maine, where the project of transferring the State capital from Augusta was last year revived. The suggestion was very well received, and, although the prospect of transferring the capital seems now rather remote, your Committee hopes that its action may have done something to encourage the architects of the city in their efforts for the proper solution of the problems of municipal development there.

In Boston, the study by members of the local Chapter of various problems of municipal improvement has met with rather unexpected results. For two years a committee of the Chapter collected and discussed a variety of disconnected plans for the development of lines of communication, the adornment of public places, and so

on, adding to these a plan for the improvement of the harbor according to modern ideas. The collection of plans excited so much interest that the entire report of the committee was published at the joint expense of the Boston Chapter, the Chamber of Commerce, the Real Estate Exchange, the Metropolitan Improvement League, the Stock Exchange, the Merchants' Association, the Board of Fire Underwriters and the Master Builders' Association; and, on the petition of the Metropolitan Improvement League, the Legislature directed the Governor to appoint a Commission to study the entire subject, and appropriated a generous sum for its expenses. One of the members of this Commission is the present President of the Boston Chapter. Meanwhile, the plans shown in the report for the improvement of the harbor attracted the attention of citizens more interested in utilitarian than æsthetic questions. The Mayor almost immediately appointed a municipal Water Front Commission, to study the whole subject of the development of the port; while the Legislature, by resolve, specifically instructed the Harbor and Land Commission, a permanent and important body, to consider the expediency and cost of establishing a system of public docks, substantially as advocated in the report; and, at the instance of the Governor, still a fourth Commission was appointed, with extensive powers, charged with the consideration of matters in general relating to the commerce and industries of Massachusetts.

Those who imagine architects to be mere draughtsmen may object that the study of dock systems is rather engineering than architectural work; but it is said by engineers themselves that the habit of dealing with problems involving a great variety of considerations peculiarly qualifies architects for the comprehensive treatment of general schemes of the kind; and, as a matter of fact, the Free Harbor of Copenhagen, which is reputed to be, for its size, the best arranged in Europe, was designed and carried out by an architect; so that, in our professional study of the improvement of seaport towns the commercial side of the question should not be forgotten, and may, indeed, often be combined very effectively with purely æsthetic considerations.

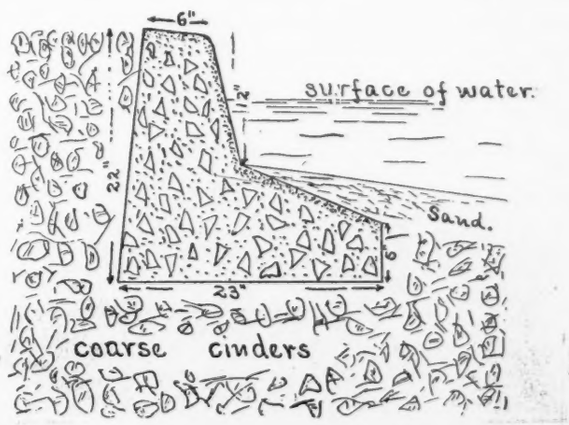
In January, 1907, the New York City Improvement Commission presented to the Mayor and Aldermen a detailed report, of great interest, supplementing the preliminary report of 1904. In the new report a broad and comprehensive plan is proposed, intended to afford adequate avenues of communication between the different parts of each Borough, as well as between the different Boroughs themselves and the outlying districts, and to secure a continuous park system, connecting the parks in each Borough. Many other important suggestions are made, and tentative solutions offered for problems of great difficulty. At a meeting of the New York Chapter, to which representatives of all societies interested in city improvement were invited, the new report of the Commission was warmly commended, and the municipal authorities requested to make some arrangement to continue the work, and carry the suggestions into effect; and the Board of Estimate and Apportionment is now considering some of the most important recommendations made by the Commission.

In Chicago, where important improvements are now being studied by Mr. Burnham, the plans have not, as yet, been fully determined, but the scheme promises to be of great interest and it is worth noting that an adequate modern dock system forms a part of the improvements projected here.

Curb for Wading Pools

IN THE parks of Fall River, Mass., two of the ponds are used as wading pools and it is desirable that the depth of water at the edges of these diminish to practically nothing, in order that their use for this purpose by children may be as easy and safe as possible. It was found, however, that the water was washing away the walks which surround the edges of the pools and that these were gradually disappearing, and the Park Superintendent finally decided to surround them with curbing. There were some difficulties to be overcome in the design, one of these being that the curbing must resist all frost action; another, that it would be curved throughout and yet must be built as cheaply as possible. It was finally decided to build a curb of the section shown in the illustration, to be constructed of concrete in proportions of 1:3:5, with a finished wearing surface one inch thick composed of 1:2 to mortar. The curbing was built in 20-foot sections, and at each joint there were inserted two one-inch iron bars to act as guides to the movement of the curb which would be caused by temperature changes. These bars were greased and wrapped in paper before being inserted, and, after the concrete was partially set, were tested to ascertain whether they were loose. Also, at each joint a piece of tarred paper was placed between the sections. The curbing has now passed through one winter with no visible damage from weather; the only breaks in the surface yet appearing being at one or two places where workmen have been careless in dragging the snow-scrapers over the curbing.

The excavation and other work, except the actual construction of the concrete, was done by the city. The concrete work was done by Warren Brothers Company at



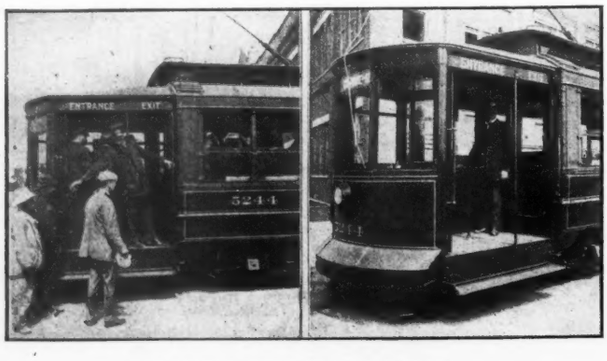
CROSS SECTION OF CURB FOR WADING POOL.

their bid of $1.14 per linear foot. This curb was placed around both ponds, 1,008 linear feet being used at South Park Pond and 613 linear feet at North Park Pond. The cost of the excavation, cinders for foundation, removal of surplus material, clearing up and all other work, including engineering and inspection, was 52 cents per linear foot at South Park Pond and 61 cents at North Park Pond. In the latter, the excavation was mostly in hardpan, and the cost included casting back about 120 cubic yards of sand.

Pay-as-you-enter Cars

The constantly and rapidly increasing amount of street traffic which is carried by American cities is calling for improved methods both of handling crowds and of construction of conveyances. In New York City there was inaugurated last week a service of special subway police who began their control of the entrance and exit of passengers into and from the subway cars, and it is stated that on the first day the time required to load and unload cars at the Grand Central Station was shortened from a previous average of 76 seconds to from 49 to 59 seconds.

Another change which is about to be made in New York is the introduction of pay-as-you-enter cars. This car has been perfected during the last three years and adopted in Montreal, Canada, and its success in reducing the number of accidents and in facilitating the handling of passengers has attracted considerable attention. Cars of this style were placed in Chicago the first of last week, and during the same week a number reached New York City, and it is announced by Oren Root, Jr., the General Manager of the Metropolitan system, that these cars will be in service on the Madison avenue line to the exclusion of the old style before the end of the year. Similar cars are also under construction for the cities of Buffalo, Cleveland and Detroit. The Chicago cars have a length of body of 32 feet 5 inches, or a length over all of 45 feet 9 inches, and an outside width of 8 feet 2½ inches, outside width 9 feet. The total seating capacity is 44, there being 7 cross seats on each side of the car and longitudinal seats in each corner. One advantage claimed for these cars is that the conductor, since he collects fares at the door of the car, is continually upon the platform, where he can superintend the getting on and off of passengers and thus avoid many accidents. The platform is divided into two parts by a rail, by one of which passengers leave and by the other they enter the car, thus much of the confusion at stopping places is avoided. Passengers may alight by way of the front platform, but not enter, this door being under the control of the motorman. In entering by the rear platform all passengers pass the conductor, who is stationed there in a space between the exit and entrance doors. The entrance part of the platform will hold 20 persons, who will stand there immediately upon boarding the car before paying their fares. Another advantage of these cars is that the conductor is able to keep out additional crowds when the proper number have been admitted, when it is required or desired that the number of passengers shall be limited other than by its absolute capacity, as under a no-seat-no-fare ordinance.



PAY-AS-YOU-ENTER CAR AT CHICAGO

Fair Returns for Public Service Corporations.

In a report to the city of Detroit, Mich, made by H. H. Crowell, upon the plants of and services rendered by the local electric lighting companies, are found the ideas of the writer upon what constitutes a fair return to such companies. This should be, he says, figured over and above the operating expenses and all depreciations of the plant which have taken place during the period. The management and skill represented in the corporation are entitled to a return in addition to the return on the investment.

> Consideration must be given to any element of hazard in the business, it being a well known fact that capital cannot be secured for an undertaking where there is an element of risk, unless there is a relative increase in the prospective rate of return. The rate of return, to be fair, must be enough to attract sufficient capital to found, subserve and extend the business as the growth of the community requires. The operation of the company must, therefore, net something more than simple interest, which simple interest could be secured without incurring a hazard of such an undertaking or without the employment of executive ability or managerial skill. The fair return thus assumed should be calculated upon the proper basis of valuation of plant or assets reasonably required.

He uses seven per cent. in this case in calculating such fair return, figuring it upon the "fair value of the tangible assets reasonably required in the undertaking;" assuming that the general hazard of the enterprise has been fairly well eliminated, that the business is on a sound basis and that the company operates practically under exclusive franchises, and that it will secure and maintain all the business which the community calls for. In their reply to this one of the companies concerned advances the counter proposition that an average return of seven per cent. to stockholders would be fair, but that these have already waited for many years without receiving any dividends, and that a seven per cent. return when the money is placed upon a paying basis would not sufficiently recompense them for the past when their investment was giving them no income.

Stamford's Incandescent Lighting

We are informed by the Stamford Gas and Electric Company that we were misinformed as to the candle power of the incandescent lamps furnished by them, which we stated in our November 27 number were "not less than 20 candle power each;" the company stating that this should have been given as 25 candle power.

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It is also desired that the facilities furnished by the reference library in this office should be widely known and freely used by those interested in municipal affairs. Visitors will be welcomed and provided with conveniences for search, and inquiries by mail will be promptly dealt with.

DECEMBER 4, 1907.

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Condemnation Evils

IN the report of the Committee on the Revision of Greater New York's Charter, which is very briefly abstracted in another column, reference is made to the abuses of condemnation proceedings and commissions, and recommends as a substitute therefore a Court of Condemnation. This is an evil which exists in many other cities throughout the country and annually robs their treasuries of larger sums than many others which are brought more prominently to the attention of the citizens. Possibly the evils resulting from the system are greater in New York City, even proportionally to its size, than in many if not most others, but they are by no means confined to it. We have before us the report of a water system of a town of about 12,000 population in which it is stated that the land for a reservoir, etc., had been obtained by condemnation, and a commission of appraisal awarded about $103,000 to the owners in payment therefor. The expenses of this commission were $22,500, of its attorney $14,000 and of the experts about $12,000; the whole expenses being about 45 per cent. of the appraised valuation. Later other land was acquired for the same water works, three appraisers fixing its value at $26,912, the expenses of the commissioners, their lawyers and witnesses being $26,758, or but little less than the value of the land. These expenses were undoubtedly legal, but the law which allows them to reach such proportions must be greatly in need of revision. It is, of course, quite possible that where the value of a piece of property is but two or three thousand dollars the cost of appraising it may reach an equal amount; but why three appraisers, a counsel and a few witnesses should receive $27,000 for valuing farm land in a district where wages and incomes are not abnormally high is not self-evident, to say the least.

It is probably the theory that such commission will be composed of local experts in the valuation of property of the district in which they are situated; but, as appears in the above cited case, these supposed experts called in witnesses to testify as to the value; and a limited acquaintance only with the proceedings of such commissions indicates that they are much too likely to be influenced by local friendship and the too-prevalent idea that an individual is entitled to vastly greater consideration in financial matters than a corporation, either municipal or private. Such commissions probably are based upon the same idea which led to trial by jury in criminal cases; but entirely aside from a belief entertained by many that jury trials are far from ideal and that in the majority of cases a trial by jurists would be preferable, condemnation commissions are not under the guidance and control of a judge, as are juries. It would, in our opinion, be much preferable to submit the question of valuation in condemnation proceedings to a judge acting as referee or, if the jury idea is carried out, such jury and its witnesses should be paid as such and the case be conducted by a court of the district or county.

Sulphur-sand Sewer Pipe Joints

SOME months ago there was described in this journal a method of making sewer pipe joints in wet trenches by the use of sulphur mixed with sand which was poured into the joints very much as lead would be poured into cast-iron pipe joints. This method was, we believe, first used in a sewer system built in New Jersey by Alexander Potter, and has been used there and in other places for several years past. There are some

difficulties in the handling of this jointing material which have interfered with its general adoption, even under conditions where its use would otherwise be advisable. The engineering department of Newton, Mass., under the direction of Irving T. Farnham, City Engineer, and Assistant City Engineer Kimbal, have recently experimented quite extensively with this material and state that they now very rarely fail to obtain a good joint. As conducted by them, a mixture of equal parts by bulk of sand and sulphur is heated in a gasoline furnace to a temperature of between 230° Fahr. and 250° Fahr. and is poured into the joint in the same manner as a lead joint would be poured. The sand and sulphur must be thoroughly mixed together and the very finest of sand must, therefore, be used, since if the sand is too coarse it will settle to the bottom and form a sort of sludge. The fineness of the sand used in Newton was such that 50 per cent. passed a 200 mesh sieve and 99 per cent. passed a 50 mesh sieve. One of the great difficulties with using this material is the necessity for having the temperature just right; for if heated above the proper temperature the sulphur becomes too thick for pouring, and it must be used at the temperature at which it is thinnest. One method of cooling when it becomes too hot is to add and stir in some of the unheated composition. The best results in Newton have been obtained when a special sewer pipe is used which has a bell three inches deep and provides a ⅝-inch annular space between the bell and spigot. The jute is thoroughly and evenly calked into the space to a depth of one inch, thus leaving a 2-inch by ⅝-inch space for the jointing material, which is sufficient to prevent this being chilled before the space is filled. The outside of the joints is covered with tar or some similar substance. When once in place the material hardens in a few seconds and this is its chief advantage for use in wet trenches, since by active pumping with the suction in the bottom of the bell-hole even a considerable flow of water can be kept below the bell of the pipe for two or three minutes. The joint is quite strong, sufficiently so to permit three or four lengths of pipe to be connected before being lowered into the trench.

Where the mixture of sand and sulphur is made upon the trench it will be necessary to oversee this rather carefully, since the men quickly find that an excess of sulphur makes the joint pour more easily; but, besides increasing the expense, this causes cavities in the joints. A mixture of what is thought to be the best proportions and with a specially desirable grade of sand is for sale under the name of Pozite. The density of the material is indicated by the fact that, after heating and mixing, the volume is but 56 per cent. of that of the combined volumes of the original substances.

A test was made in Newton of two sewers of equal length on parallel streets, one of which was laid with the best of cement joints, using cheesecloth to hold the cement in place until set, and the other with sand sulphur joints. It was found that there was a saving of 20 per cent. in favor of the sand sulphur joint.

Proposed Provisions for New York Charter

THE Charter Revision Commission of New York City submitted to Governor Hughes last Saturday its report containing recommendations for a new charter for Greater New York. Many of these involve fundamental changes from the present charter; the controlling ideas throughout apparently being the concentration of power in individuals rather than in cumbersome boards; and the idea of home rule for the city as a whole, together with a lessened local control by the individual boroughs, looking toward a more thorough amalgamation of these into one homogeneous whole. The general idea, however, does not follow the lines of the "commission system" of government which has been adopted by several cities during the past year or two.

The Board of Estimate and Apportionment would consist of the Mayor, Comptroller, President of the Board of Aldermen and four members of high legal standing elected at large by the voters. For the present method of practically separating many of the departments into units, one for each borough, would be substituted one department for the entire city, the head of which should be represented in each borough by a deputy. The budget would be under complete control of the Board of Estimate, but local improvement boards would have power to authorize, without its approval, improvements costing not more than $5,000. The Board of Estimate should adopt a comprehensive plan of public improvements. The budget should be entirely in the control of the Board, and should be segregated or itemized to a much greater degree than at present

A Bureau of Statistics would take the place of the present Commissioner of Accounts and of the Board of City Record. A Purchasing Department would be established, which would furnish supplies for all the departments, being divided into bureaus, the head of each to be an expert upon the subject over which he has jurisdiction. The Aqueduct Commission would be abolished (as it should have been immediately upon the completion of the aqueduct). A Department of Street Control would be created which would have charge of the construction and repair of streets, sewers, pavements and other structures and openings for all purposes in the street surfaces; exercising also all street cleaning functions, having charge of lighting streets and of the location of all conduits, whether municipal or private; in short, possessing all authority and control over the streets except that of traffic regulation, which should be placed completely in control of the Police Department. The Tax Board would be replaced by a single commissioner.

Two evils to which special attention is paid are those of condemnation commissioners, which now cost the city millions every year, and for which they would substitute a Court of Condemnation; and the present practice of the State Legislature of compelling expenditures by the city which the city government is opposed to, or at least has not requested.

THE DISPOSAL OF MUNICIPAL WASTE

Systems and Methods with Special Reference to American Conditions—Revised Table of Calorific Values—The Collection Service by Contract and Municipal Agency—Why Progress is Slow—Conclusion

By W. F. MORSE, Sanitary Engineer

This Series of articles, begun in February, 1906, and continued in the first number of each month, is concluded in this issue.

The Subjects Treated by the Author Are:—

1. The Waste Collection Service in American Towns; Methods and Results.
2. Definition of Terms; Quantities; Proportions; Character of Waste in General.
3. Garbage; Analysis; Proportions; Values.
4. Dry Refuse and Rubbish; Quantities and Treatment.
5. Classification:—Commercial Values and After Recovery.
6. The Refuse Utilization Stations in New York, Boston, Buffalo, and Brooklyn (illustrated).
7. Municipal Ashes; Analysis; Proportions; Values when Separated.
8. Ashes from Cremation of Garbage; Analysis and Values; Comparative Table.
9. Comparison of Ashes from English and American Cities; Cremation Means.
10. The Utilization of Municipal Waste in General; English and American Methods.
11. Commercial Values of Refuse and Ashes when Marketed and Manufactured.
12. The Analysis of Garbage; Tankage; Its Value (Special Tables).
13. The Garbage Disposal Plant, Cleveland, Ohio.
14. Street Sweepings; Fertilizing Value and Treatment.
15. Comparative Commercial Values of Waste.
16. Foreign Destructors; Special Chapter by an Eminent Authority.
17. The First Garbage Cremators.
18. Official Reports on Cremators.
19. Chronological List of American Crematories from 1885.
20. List of Government and Institutional Installations.
21. Consolidated Tables of Installations; Hygiene and Sanitation.
22. Types of Furnace; the Operating American Furnaces (fully illustrated).
23. Portable Crematories (illustrated).
24. Summary of American Furnaces.
25. The Destructor System Using High Temperature (illustrated).
26. Calorific Value of Waste as Fuel (Comparative Tables).
27. The Collection Service by Contract.
28. The Reason for Slow Progress. Conclusion.

Tables of Calorific Values

THE tables in the November 6th number of this journal were made under pressure of limited time without opportunity for careful revision, and some changes and corrections of the figures will make them clearer.

In table XXXVII, the calorific power of fine ash, 1937, and clinker, 1120, in Col. 17, should appear in Col. 13 under calorific power. The combustible value is, as stated, assumed at 12,000 B. T. U.

In table XXVIII, Col. 1, the term "rubbish" should be "refuse." "Garbage dry" and the figures following should be omitted, as these values are given in "garbage wet." The totals of Cols. 2, 3 and 5 should be omitted, as they tend to confuse the calculations. The two remaining tables are rearranged as shown below.

THE UTILIZATION OF CALORIFIC VALUES IN MUNICIPAL WASTE

WHEN the heat values of municipal waste are accurately analyzed and accounted for, the reasons for the successful work of the destructors operating under forced draft are more clearly defined and become evident. That the work done by destructors is satisfactory, is established beyond a question, but all the facts have not been clearly known to the American public.

It has been often reported that these means would not work here, because of more moisture, less coal equivalent and less combustible refuse in the waste, than was the case abroad. These statements, united to the opposition of the reduction process companies, have been allowed to influence the municipalities against any consideration of better methods. Not until the towns have sent their own engineers abroad, for independent investigation, has there been any progress, and when their favorable reports are embodied into operating plants, then it is evident that there is no appreciable difference either in the material to be destroyed or the apparatus used for the destruction service.

When Waring built his first refuse plant in 1904 it was the demonstration of a means, first used abroad, that could be perfectly well applied in New York. The same method used in Boston for nine years, in Buffalo for five years, and in Brooklyn for three years, for the treatment of refuse, is proof that Waring's theories and methods were correct. The failure of the refuse incin-

TABLE XLV—CONSOLIDATED TABLE OF CALORIFIC VALUES OF MUNICIPAL WASTE

Materials as Collected See Table XXXVII	One Ton Ashes, Rubbish Garbage and Refuse,			One Ton Rubbish, Refuse and Garbage						One Ton Ashes, Rubbish and Refuse				Equivalent Coal Value in One Ton Each Separated Waste, Ashes, Garbage, Refuse, Lbs.
	Component Parts as Coll't'd	Per Cent. Proportion in One Ton Lbs.	Coal Equiv. at Calorific Values Lbs.	Component Parts as Coll't'd	Per Cent. in One Ton %	Weight in Lbs.	Garbage Composition %	Weight in Lbs.	Coal Equiv. at Calorific Value Lbs.	Component Parts as Coll't'd	Per Cent. of Weight %	Weight in Lbs.	Coal Equiv. at Calorific Value Lbs.	
Ashes: Fine Ash	34.7	694	103	.....	.....	.....	.....	.....	.....	34.7	46.2	924	138	164
Ashes: Coal and Cinder	26.7	534	201	.....	.....	.....	.....	.....	.....	26.7	35.6	712	268	318
Ashes: Clinker	1.8	36	3	.....	.....	.....	.....	.....	.....	1.8	2.3	46	4	5
	63.2	1,264	307							63.2	84.1	1,682	410	487
Rubbish: Glass, Metals, etc.	4.8	96	.....	4.8	13.0	260	.....	260	.....	4.8	6.4	128	.....	.....
Garbage: Free Water	.....	498	.....											
Garbage: Moisture	24.9	Moist., 71.4% = 355	.....	24.9	67.7	1,354	71.4 Moist.	967	.....	.....	.....	.....	.....	.....
Garbage: Solids	.....	Solids, 28.6% = 143	90				28.6 Solids	387	252	.....	.....	.....	.....	363
Refuse	7.1	142	92	7.1	19.3	386	.....	386	250	7.1	9.5	190	122	1,298
Totals	100 Pts.	2,000	480	36.8	100%	2,000	100%	2,000	502	75.1	100%	2,000	532	2,148

erators at Forty-seventh street and at Williamsburg Bridge was not because of the lack of power developed, but because of the faulty design and construction of the furnaces used.

The results of the work of one single destructor installation in Canada, burning mixed municipal waste, are so satisfactory and convincing, that the city of Montreal is now seriously considering the feasibility of turning all its waste into steam power for its own electric lighting, and the assertion is made by responsible engineers that the town can be lighted by the destruction of its own waste, without other fuel. Now that we positively know from practical experience and competent analytical and engineering advice, that the American municipal waste has an absolutely certain value for producing power that will return a revenue to the town, there is no reason why it should not be done when conditions warrant. When this power cannot be used, the destructor is built for disposal only, at no greater cost than the relatively larger crematory or incinerator and operated at less expense, with far greater sanitary protection.

The chiefly important question is the disposal of the waste for the benefit of the public, not the building of a great incinerator at a large cost that fails in each point of economy of service and sanitary working. If progress is to be made, it must be by improvement, not in repeating the failures of the past years.

Collection Service by Contract and Municipal Agency

This question, of whether the towns shall have the collections made through the agency of contractors or shall themselves undertake the work, is another of the points which, at the present time, are still in doubt. About ten years ago the writer made an examination of the cost of the service in fifty New England cities. In about half of these the work was done by contract, in the others by municipal agency. This applied only to the garbage collections, as at that time no records were kept of the removal of ashes and refuse, and no statistics could be obtained. It appeared, in the cities reported upon, that the contract service cost on an average of 15 cents per capita per annum. It also appeared that by municipal service the average cost was 22 cents per capita per annum, showing a difference in point of expense in favor of the contractor. The increase in cost of this collection service since then has brought this average to about 19 cents for contract and 25 cents for municipal service, per capita, per annum.

Under the shifting control of American cities, caused by the revolutions in politics, every department of a city suffers more or less by the periodical overturn and the coming into office of a new set of officials of another political party or who may be elected by the "reform movement," and whose policy of action seems to be the reversal of everything done by their predecessors in office. There is probably no department of municipal administration which is subject to more violent changes of method than that of the collection and disposal of waste. It follows, naturally, that when changes are made for no good reasons and without due consideration, the results are not always the most beneficial.

Under the contract system the city officials hand over to a contractor the whole service, and put upon him the responsibility of doing a work which should properly be done by themselves. If the contractor does the work at a low price it is sure to be poorly done, as he cannot afford to do it well. If the contractor receives a large compensation, then the work is likely to be overpaid, and manifestly an injustice has been done to the city tax-payers.

The golden mean between these extremes which works justly for both parties is rarely attained, and there is always friction between the people on one side and the contractors on the other, leading to complications and disputes which in the end always have to be settled by the municipal authorities. Again, the question of politics comes into the matter. The number of employees required by the contractor or at his disposal, is sometimes an important factor in a close election, and through this means there may be brought up a political measure which will perpetuate the abuses which gradually creep into this branch of service. During the past ten years the writer has observed that the cities are getting more and more to prefer municipal to contract agency.

The foregoing is not altogether true of cities of the first and second rank which have contracts for collection running for terms of five to ten years, and which are difficult to change. But it is certainly true of a large number of cities of the third and fourth classes which have heretofore had the work of collection and disposal performed by contractors and licensed collectors, and which are now adopting the municipal method.

This is specially the case in cities in which the executive work is carried out by a Commissioner or by a Board of Public Works, and as the government of American towns is becoming more and more a matter of commissions rather than of committees of Councils, it is to be expected that the adoption of the municipal service will be more frequent.

While the cost when performed by municipal service is somewhat more than by contract work, the ultimate results are, as a rule, far more satisfactory. There is then responsibility both upon the city officials and the city employees which cannot be evaded, and which requires a good executive to place the work upon a high plane, and to give it the importance which it deserves. Thus, in the hands of a thoroughly competent man the collection and disposal service of the city can be conducted in such a way as to arouse the attention of the population and gain its approval. No resident of New York can fail to remember that in the four years' administration of Col. Waring a complete revolution took place in the Street Cleaning Department. None who saw the parades of the "White Wings" failed to recognize the change in the personnel of employees, the development of *esprit de corps* due to the influence of Waring, and the result of his excel-

lent work. The methods which he established have done more for the civic cleanliness and the well-being of the citizens of New York than has ever any other agency working for the purpose. The effects of his enterprise and originality are apparent in other cities where the same questions have been taken up, and his methods adopted.

The Reasons for Slow Progress

Since this series of papers was begun the writer has received many letters relating to the points touched upon. One of these points is that of the reason for the lack of progress in disposal work in this country during the past twenty years. Among those who have expressed themselves most forcibly is Mr. F. K. Rhines, Secretary and Engineer of the Dixon Engineering and Construction Co., who has for many years studied the matter from a practical standpoint and who has had wide experience in dealing with the various phases that are presented. His statement may be read with the respect due an honest expression of experience and a desire to contribute to the solution of the problem. His statement is as follows:

Without considering at present those municipal governments (by no means as uncommon as they should be) which are controlled by political bosses, individual or corporate, and also ignoring for the moment that element of public life to be lightly discarded. Let us be thankful for the case of the honest, intelligent public official who earnestly desires to serve the people who elected him. His case only is of interest, for in it only is found any present promise of fulfillment of the real function of the office-holder—the service of the people.

Honest and intelligent the man may be, but how often are these admirable, but insufficient, attributes combined with the complementary qualification of competency? The practice has so established itself through long custom that, although we usually put a C. E. in the City Engineer's chair, and demand a Health Officer who can show a doctor's degree, men are set up as law-makers for their city without question as to their qualifications, provided only that they can show the required number of votes.

But honesty and intelligence are quoted too high in public life to be lightly discarded. Let us be thankful for these, and content—for a beginning. That we are still only at the beginning of many things municipal which will be considered as elementary necessities half a century hence, is no great wonder when it is remembered that so comparatively short a time has elapsed since the beginning of everything in this country that we have been obliged to face our manifold problems of civic life in the order of their insistence.

There are scores of cities whose Mayors went swimming as boys where the City Hall or Post Office now stands, which have had their whole civic growth compressed into a quarter of a century, and surely they may plead the excuse of a "busy day" if they have neglected some of the more modern arts and principles of municipal well-being. But there are plenty of others that were well-groomed cities before their present Mayors were born, which still have made no pretense of establishing even a system of public refuse collection, to say nothing of disposal, and which, apparently, have not even commenced to awaken to a sense of civic responsibility in the matter.

So, when many of our cities and towns have not yet recognized the fact that there is any "garbage disposal problem," and the rank and file of the city fathers are still far from being specialists in such familiar matters as street paving, lighting, water works and sewerage, is it not more cause for regret than wonderment if they are all at sea when it comes to handling those newer departments of municipal endeavor which are still unknown, unheard of, to so many?

But ignorance is merely an explanation—not an excuse! And it is becoming more inexcusable every day. If by mistakes we learn and by failures we advance, then the past twenty years of American experience in garbage disposal cannot be without value; yet it would almost seem to be so, as far as concerns the usual way of getting at the facts.

It is a distinctly American trait to yearn for first-hand experience. In this sense we are all "from Missouri." As cities we are not willing to take anybody's word for anything. But in the case in question, is it not generally true that the desire to be "shown" arises from ignorance of the fact that there is anyone whose opinion is of value,—for whose expert advice money spent is not merely spent, but well invested?

The most superficial survey of the experience of almost any dozen cities in this country cannot but convince one of the haphazard nature of the efforts put forth in this direction. When bids are invited for the construction of a garbage disposal plant, not one city in a hundred can give prospective bidders any intelligent idea of the amount, character or composition of the waste matter to be dealt with. Frequently it has not been even decided whether the reduction or incineration method will be employed, where the plant will be located, what classes of waste will be handled, whether it is desirable to attempt power production, or what disposition is to be made of the residue. Yet these are all data to which the bidder is entitled,—which he must have in order to design and build a plant suited to the city's individual needs, and in order to be at all certain of accomplishing the results sought after. Without this information, which the city receiving proposals is rarely able to give, and which the bidder is still more rarely able to secure for himself, the installation of any system must be made more or less at random and results are bound to be in the same degree problematical.

Yet instead of securing the services of some competent consulting engineer who has made a special study of refuse disposal, the average city, when it finally does step out and determine to do something toward cleaning up and becoming a pleasanter, decenter place to live in, goes about the matter as if it were exploring unknown wilds. Little heed is given to the mistakes and failures, or even the successes, of other cities—too little, at any rate, to learn why failure or success resulted. Some energetic Health Officer conceives the idea of inaugurating better methods of garbage disposal, and brings the matter to the attention of the City Council. At best an investigation and report are asked of the City Engineer; or perhaps it is referred back to the Health Officer, whose hands are already more than full, if all his duties are properly attended to, even if he were competent to furnish the expert knowledge needed—but more often the whole question is turned over to a committee of Councilmen who are still less qualified to solve the technical difficulties of the problem.

Incompetent builders certainly share with incompetent officials the blame for much that is wrong and unsatisfactory in existing conditions,—but the former are the direct result of the latter. When competent engineers make the necessary preliminary investigations, draw the plans, compile the specifications and supervise the construction, none but competent builders can do the work.

On the fingers of one hand can be counted the American cities which have confronted this question in a really intelligent way. In many others tolerably satisfactory results have been attained, but chance has always had a hand in the game and it merely happened that good luck, not bad luck, held the trumps.

It is interesting to note that at the present time some of our most important cities are commissioning consulting engineers to make reports and recommendations in reference to refuse disposal, but this is really an innovation, where it ought to be the ordinary, every-day, matter-of-course procedure.

Preparation of Specifications

The statement made in the foregoing in regard to the deficiency in information furnished for prospective bidders is emphatically true in almost every case where tenders are called for. There are two conspicuous instances in which the specifications issued by the town were carefully prepared, giving necessary preliminary information, and which required definite, official reports of previous work done by prospective bidders and certificates of satisfactory operation of the apparatus it was proposed to furnish. In each case the towns received proposals which were in every respect complete, specific, definite and entirely satisfactory. The bidders knew what the towns wanted and were enabled to offer it. In each case other bids were submitted which did not conform to the specifications and which were promptly rejected although the prices stated were very much below the tenders actually accepted.

In another later competition where a town was advertising for a disposal plant the specifications were so poorly drawn up, so indefinite in terms, that the bids received for the same piece of work were more than $15,000 apart when the appropriation was $30,000. As a natural consequence all bids were rejected and the work had all to be done over.

It is in this particular of preliminary information and the drawing of specifications as well as the final review of the value of tenders received, that the work of an experienced engineer versed in the subject is of the greatest service. We may, therefore, expect that whenever this question is of sufficient interest to municipalities to warrant a thorough examination of the conditions, the preparation of the necessary preliminaries for the issuance of specifications which shall exactly define what is needed, in the future they shall not be constructed in the indeterminate way now generally employed. If the work in this country is worth doing at all it is worth doing well, and a municipality is greatly at fault if it fails to realize that its interests and its people's well-being are concerned in obtaining the very best system of waste collection and disposal that can be had. We may look for progress now that the way is open, and we may expect the results to be commensurate with the success of the effort made to obtain the appropriate, most durable and efficient methods that experience has shown to be the best.

Conclusion

This series of papers was begun at the request of the editor of the Municipal Journal and Engineer two years ago. In a way the papers are the answer of the writer to numerous inquiries made to him personally upon matters connected with the service of waste collection and disposal in this country. There seemed to be no better way to answer questions than to give such information as long experience in connection with the work had enabled the writer to obtain, and to place this at the service of the correspondents in the columns of this journal. It is a fact that the literature on this subject is very limited, and that little has been published which bears upon the practical questions which affect the municipalities. There was an evident demand for some details which could not be obtained except from those who had gone through practical experience in this work.

It was a comparatively new question for the engineering fraternity. Only one or two of the engineers of the country had ever taken the time to inquire into the apparatus in use here and abroad, and at first none had made a thorough study of the advantages or the deficiencies of the American systems of garbage crematories. As the work progressed the writer found the subject enlarging under his hand, and it seemed to be wise to give as far as could be compressed in the short space allowed, a sketch of each of the various systems of cremation which are now in use in this country.

Finally, as a means of arriving at what might be the most successful for future use, a comparative estimate of the operation of the two systems of cremation and destruction in this country and other parts of the world was necessary to be made.

There are still many other questions which at this time must be left for future treatment in another form. No attempt has been made to describe the utilization of waste by the reduction processes. This method of waste disposal, like cremation, has had its vicissitudes of failures and successes. The permanent establishment of one or another of the several methods in use is of the future, and these methods are developing, just as the methods of cremation are doing. A good deal has been said, but little has been published on this subject, and it is extremely difficult to obtain accurate information.

Still another question connected with this topic is the formulating of a system of records which shall cover the collection and disposal work, which should be accurate, concise and comprehensive, and which might lead to the establishment of a standard of comparison for municipalities, by which all the towns in the country may standardize their reports.

Another greatly needed innovation is a better system of accounting which shall convey in terms that are common to all the country the information on particular points which always come up in disposal work. The use of words which mean the same thing is something that should first be well-established. In other words, the terminology of the work should be made to conform to a given standard; otherwise there can be no intelligent discussion when allusion is made to the same subjects.

It is the purpose of the author to condense the information collected, to bring all this matter up-to-date, and include the various points and sub-divisions of the whole subject, concisely expressed and illustrated by such cuts, diagrams and tables as will convey a fairly clear idea of the past history and the present situation of the work of municipal waste collection and disposal in the cities and towns of this continent. This work will be ready for publication in book form in a short time.

(*Concluded.*)

NEWS OF THE MUNICIPALITIES

Divers Subjects of General Interest and Their Treatment by City Councils and Officials—Streets, Water Works, Lighting and Sanitary Matters—Police and Fire Items—Government and Finance

Roads and Pavements

ALTOONA, PA.—The sidewalk crusade, which was inaugurated by Mayor Walker at the beginning of his term of office, is drawing to a close with the approach of winter, and the results which have been accomplished are most gratifying. A total of 170,267 feet, or more than 32 miles, of substantial walk has been laid during the three years of Mayor Walker's term. The total during the past summer has been 64,207 feet, or over 12 miles. Mayor Walker has expressed his hearty appreciation of the co-operation given him in the making of these improvements by the people of the city. With comparatively few exceptions the citizens have responded to his notices and coercive measures have not been necessary. These 32 miles of walk have made a marked improvement on the appearance of the city, and the Mayor expresses the hope that his successor, whoever he may be, will take up the work where he has stopped and keep it up until every thoroughfare in the city is lined on both sides with a substantial walk.

BALTIMORE, MD.—The South Baltimore Business Men's Association has employed Mr. George Stewart Brown as counsel to protect their interests and endeavor to hasten the abolishment of grade crossings of the Baltimore and Ohio Railroad. The association holds that there is no safe street by which to cross the railroad south of Camden Station to Ostend street, excepting at the Lee street bridge, and to cross that bridge is like mounting a trapeze; besides, it will only accommodate pedestrians. The other streets, like Barre and Henrietta, they insist, are dangerous and fraught with unnecessary delay to traffic.

ELIZABETH, N. J.—The City Council has decided to make a determined effort to abolish the thirty-two railroad grade crossings. The State Railroad Commission will be supplied with a comprehensive report compiled by the railroad and Street Railway Committee of the City Council, and will be asked by Mayor P. J. Ryan to investigate. Along the Long Branch division of the Jersey Central Railroad are sixteen grade crossings, eight of which intersect streets where there is a great deal of traffic. There are also four other crossings on the principal downtown thoroughfares.

EVANSVILLE, IND.—Persons violating the law covering the hauling of dirt along public highways in wagon beds that are not tight, or overloading their vehicles, will be prosecuted in the future to the fullest extent of the law. The ordinance covering the size of wagon tires is also to be enforced.

Its provisions are:

The weight of any load hauled over any of the streets or alleys of the city, by any four-wheeled vehicle, shall not exceed in amount as follows, viz.: 8,000 pounds for tire of 6 inches or more in width; 6,000 pounds for tire of 4 inches or more in width; 5,000 pounds for tire of 3 inches or more in width; 3,000 pounds for tire of 2½ inches or more in width; 2,500 pounds for tire of 2 inches or more in width; 2,000 pounds for tire less than 2 inches in width. Provided, that all four-wheel drays shall have tires of not less than 3½ inches in width.

The weight of any load hauled over any of the streets or alleys of the city by any two-wheeled vehicle shall not exceed in amount as follows, viz.: 5,000 pounds for tires of 6 inches or more in width; 4,000 pounds for tires of 4 inches or more in width; 3,000 pounds for tires of 3 inches or more in width; 2,500 pounds for tires of 2 inches or more in width; 1,500 pounds for tires of less than 2 inches in width. Provided, that all two-wheeled drays shall have tires of not less than 2 inches in width.

The ordinance also requires that a tin tag, provided by the City Clerk, and bearing the number and maximum weight of load of vehicle, shall be attached in a conspicuous place.

HOUSTON, TEX.—City Commissioner Marmion says he intends in future to oppose paving streets with brick unless the foundation be of concrete. He says where there is an incline permitting the water to rush down the street, the paving should have a cement fluid placed between the brick. The Commissioner made this statement after an inspection of the damage done to streets and bridges by a recent heavy rain, and which he estimates it will cost $5,000 to repair. Bridges and culverts all over the city were washed out of position, and under the Milam street bridge about 500 loads of dirt will be required to fill in. The street approaching Sabine bridge was badly washed out, and it will be necessary to temporarily close the street and put in piling. Commissioner Marmion says the reason Sabine street was so much injured is because it is paved with brick and the foundation was gravel with sand on top, and that the rush of water down the street to the bridge picks the sand from between the bricks.

Sewerage and Sanitation

BRIDGEPORT, CONN.—John A. Barri has brought suit for $3,000 and applied for an injunction restraining the city from continuing to use the outlets of three important sewers. The plaintiff alleges that he had a ten-foot channel at the end of his 100-foot wharf prior to the construction of the Lindley street sewer, but now the wooden case of the sewer outlet has become rotten and permits sewage deposits to clog the channel, reducing its depth at low water to two feet, preventing vessels from discharging his cargoes, and constituting a great loss to his business, and that he has been compelled to have the channel dredged out at his own expense. Mr. Barri claims that the Noble avenue trunk sewer and the special sewer used by the Bridgeport By-Products Company aggravate the conditions, and complains against noxious odors which he characterizes as a common nuisance and considers a detriment to health, and the cause of reduction in the value of his property.

GRAND RAPIDS, MICH.—A crusade against violators of the anti-spitting ordinance on street cars has been begun by inspectors under Health Officer Delano. This action is a result of the request of General Manager Hanchett, of the Grand Rapids Railway Company, asking the Board of Health to take immediate steps to stop the practice which has become a very serious evil on the cars of the company.

KANSAS CITY, MO.—Mayor Beardsley has made the first definite move to solve the sewer problem which, he asserts, is one of the most serious questions confronting Kansas City at present. He declares that it will be only a short time until Kansas City and other cities will be prohibited from emptying sewage into the rivers from which a water supply is taken. The Mayor dictated a letter to the Board of Public Works requesting that immediate action be taken to get engineering data and other infor-

mation so that it may be known what is needed in the way of charter amendments or State legislation to meet the situation. The Board has already begun its work.

San Francisco, Cal.—The official report of Passed Assistant Surgeon Blue, who was appointed by the Federal Government to assist in stamping out the bubonic plague, states that up to November 16, there had been ninety-six cases reported and sixty deaths, and the disease seemed to be on the decrease. Of 4,500 rats examined microscopically from November 9 to 16, seven were infected with the plague bacillus; 13,000 rats were trapped; in 1,138 rats examined November 2 to 9, 17 were infected. The scheme of organization includes a general headquarters and twelve districts, each district being in charge of a service officer, a headquarters centrally and conveniently located. The personnel of the districts includes sanitary and assistant sanitary inspectors and a corps of men proportionate to the size of the district and amount of work to be done, weekly meetings of the district commanders being held for the discussion of the work and the best measures to be adopted. One of the objects of the campaign in the State has been to draw public attention to the desirability of the prompt recognition of plague and the application of preventive measures.

Water Works

Baltimore, Md.—Because it is anticipated that the expenditures of the Water Department next year will exceed by more than $360,000 the income from water rates, and the water rates at present charged in Baltimore are much less than those in any other large city, the city officials are contemplating an increase in the rates. A comparative table of prices recently received by the Department in the annual Report of the Water Department of Buffalo demonstrates how much lower the price in Baltimore is, as the minimum rate in the following cities for the smallest class of houses, equipped with bath tub and toilet, is:

Baltimore	$2.50
Buffalo	5.00
New York	9.00
Chicago	8.50
Philadelphia	6.50
St. Louis	7.00
Boston	13.00
Cleveland	7.00
Cincinnati	4.00
Detroit	5.80
Milwaukee	9.00

With the exception of Baltimore, each of the above cities charges a flat rental based on front feet or number of rooms, and then adds a charge for each bath tub and each toilet. Baltimore's rate includes water for bathing and toilet purposes. In other cities, too, there are additional charges. For instance, most of the cities make extra charges on houses where there are boarders. Buffalo charges 40 cents extra for each boarder; Boston charges 50 cents each; St. Louis charges $1 for each room occupied by boarders. A 50-cent raise is considered probable in Baltimore.

Council Bluffs, Ia.—City Engineer S. L. Etnyre is investigating a small body of water in the northwestern part of the city, near the bank of the Missouri River, known as "Hunt's pond," with a view to converting it into a source of water supply. The water in this pond rises and falls with the water in the river, which indicates some connection between the river and the pond, probably through the sand. Mr. Etnyre says the pond is certainly very deep, and if a wall were built around it, and it were cleaned out a fine supply of clear water could be obtained from the river filtered through the sand between the river and the pond. Another plan under consideration is to clean out and enlarge all the larger springs along the bluffs north of the city and use their combined flow as a supply, pumping the product to a storage reservoir on the summit of the bluffs north of Fairview cemetery, and thence piping it to the city.

Jersey City, N. J.—The Jersey City Board of Trade has adopted a resolution prepared by George R. Beach in connection with his report on the subject of meters. Mr. Beach declares that unless something is done to stop the waste, in a few years the water supply of the city will be entirely inadequate. He says further that the actual loss through faucets, etc., has, by actual test at the rate of two cents per hundred gallons, the average price in Jersey City, been found to be as follows: A one-eighth inch stream running continuously discharges 3,744 gallons per day, at a cost per year of $273.30; one-quarter inch stream, 13,881 gallons, $1,013.30; one-half inch stream, 81,792 gallons, $5,971.80; three-quarter inch stream, 187,200 gallons, $13,665.60; one-inch stream, 332,640 gallons, $24,882.70. It is the aggregate of such leaks that create the very large consumption of water, but where meters are used such leaks are stopped as soon as noticed. Where meters are not used, no attention is paid in the majority of cases unless the consumer is inconvenienced by the leakage.

Perth Amboy, N. J.—The report of Engineer S. J. Mason to the Board of Water Commissioners, of the recent test of the sixteen-inch main under the Raritan River, states there is a daily leakage of 23,000 gallons through one of the old valves which needs repairs. The test was made by shutting down the gates on this side of the river and sending a pressure of seventy-five pounds of air into the main. Where leaks existed, the water bubbled. It was deemed unnecessary to have a diver inspect that main, as it can be easily repaired.

Sheboygan, Wis.—The plan of the city to buy the water works plant from the water company has failed because the city received but one bid, of 96 cents on the dollar, on its bond issue of $360,000. The bid was submitted by S. A. Kean, of Chicago, and calls for 5 per cent. to run for eleven years. It cannot be considered, as the city bonds run for twenty years. The city finds itself in a predicament, as it is under contract with the city water company to take over the water works plant and pay for it on January 1, 1908.

Street Lighting and Electric Power

Allentown, Pa.—A report rendered to Councils by a special committee appointed to investigate the cost of lighting and power in this city as compared with costs in other cities, states that Allentown is being supplied with arc and incandescent lights at a reasonable figure, and cheaper than in many cities in the State. A statement is included showing the prices paid for such electric lights for an all-night service by the cities of the third-class in Pennsylvania, as follows:

	Arc	C.P.	Incan.	C.P.
York	$49.28	2,000		
Reading	78.00	2,000	$19.80	50
Altoona	52.50	.....	.03¾ per k.w.	
McKeesport	70.00	2,000	.....	..
Williamsport	60.00	2,000	18.00	32
Chester	80.00	1,200	10.50	16
Wilkes-Barre	60.00	2,000	.....	..
Erie	58.40	2,000	.....	..
Harrisburg	47.00	2,000	.....	..
Johnstown	40.00	2,000	25.00	16
Allentown	84.00	.....	18.00	32

The report says that from these prices it might appear that the city of Allentown is paying more for electric light service than any other city, but in many cities there

is great competition, which naturally reduces the cost of electricity considerably. Also, the bulk of lights are incandescent, and only sixteen to Allentown's thirty-two candle-power, they paying almost twice as much for their incandescent as Allentown, with less candle-power.

ST. JOSEPH, MO.—The Commercial Conference Committee is in favor of three distinct movements, namely, the issuance of $500,000 worth of bonds to build rock roads in the county, for a new city charter, and for the illuminating plan as projected for Felix street between Fourth and Sixth streets. Each member of the committee has been requested to name a man from the commercial body which he represents to work in conjunction with the men from the different townships of the county in an effort to secure the issuance of the bonds. City Council will be asked to give the illumination of Felix street favorable consideration.

WILKES-BARRE, PA.—The Wilkes-Barre Gas and Electric Light Company has brought suit against the city to recover $50,000 which it claims is due it for street lighting for the past seventeen months. Early on a Sunday morning in June, 1906, the light company sent a force of men around the city to change the globes on the street lamps before the alarm could be sounded and the police notified that the change was made. Councils refused to pay the bill and have held it up ever since. Two months ago the light company offered to compromise by throwing off the interest and $4,000 additional. After a hard fight in Councils, the compromise was accepted, but Mayor Kirkendall vetoed it. The Mayor claimed that if the light company violated its contract when it changed the globes it should be penalized.

TORONTO, CANADA.—It has been decided in the Mayor's office that a by-law is to be submitted to the Toronto rate-payers on January 1 next, to provide for raising $2,500,000 for the purpose of establishing a power and light distribution plant. Independent engineers and representatives of the Hydro-Electric Power Commission and Board of Control believe that for that sum the city can obtain 1,500 street lights, power delivered to the pumping stations, lighting of public buildings, underground conductors in the central areas (about three-quarters of a mile square and the main streets leading therefrom), supply of power to factories along the railway lines and all principal factory areas, supply of light and incidental power in a suitable manner in all parts of the city where there is a reasonable demand, facilities for extension (the estimate being based on the receipt of about 12,000 horsepower, and a possible increase to 20,000 horsepower).

Fire and Police

COLORADO SPRINGS, COL.—Fire Chief E. E. Baty, in discussing the resolution recently passed by the Chamber of Commerce in Portland, Me., and other eastern cities, recommending that cities lying close to each other should have uniform fire apparatus, so as to be of mutual aid in times of general conflagration, said he considers the proposition a good one. A copy of the resolution has been received by the Colorado Springs Chamber of Commerce, with the request that it receive the endorsement of that body, and Chief Baty says the desirability of having departments in adjacent cities fitted up with a uniform apparatus is admitted by all, but the difficulty of obtaining any reform in the matter lies in the great cost of changing. It would be a good idea to have the departments in Colorado Springs, Colorado City, Manitou, Pueblo and Denver all provided with couplings and hydrants of a uniform size, but the heavy expense of such a reform has always stood in the way of any such change.

ORANGE, N. J.—Council has been requested to favor the adoption of the Bertillon criminal identification system by the County Board of Freeholders, and the request, signed by Chiefs Henry Gallagher, James Bell and Frederick Weimer, has been referred to the Police Committee.

ST. LOUIS, MO.—Resolutions have been introduced in the City Council requiring the Board of Police Commissioners to change the system of employing Police Surgeons. City Counselor Charles W. Bates has rendered an opinion that the system of paying the Surgeon a salary of $2,000 and then forcing all applicants for position on the Police Department to pay an examination fee of $3, is illegal, and that the Board has no more right to require an applicant to furnish a receipt showing his examination fee has been paid than it has to charge a fee for the application itself. The Police Commissioners have ignored demands of the City Council for an explanation, and the several hundred men recently added to the Department, as well as applicants who were not appointed, were required to pay an examination fee.

MONTREAL, CANADA.—Acting in accordance with the powers granted to the city by the Legislature last winter, a draft by-law authorizing the inspection of buildings in Montreal for fire prevention has been considered by the Fire Committee and ordered to be sent to the City Council. The chief purpose of the proposed by-law is to permit officers of the Fire Brigade to make a general inspection of buildings, and to note what should be done to lessen the danger from fire. Cellars and basements will be visited, as well as the main floors and attics of warehouses, and a record kept of the same. The attention of proprietors will be drawn to what should be done for greater fire security, and after a certain time another visit will be made to see if the orders have been complied with.

PARIS, FRANCE.—English, German and Spanish are being taught to sixty Paris policemen, in order that they may be able to direct visitors about the city in the native tongue of the stranger. These policemen will be distinguished from their less accomplished comrades by an arm badge composed of the flag of the nationality whose language they speak, and the word "Interprète." The policemen of the first brigade of interpreters to be placed on service will be stationed at the big railway stations, on the grand boulevards, round about the Opèra and the rue de la Paix, and at other points most frequented by visitors from abroad.

Government and Finance

ALBANY, N. Y.—There will be seven instead of four cities of the second-class in the State when the charter for cities of the second-class, which was enacted by the Legislature of 1906, goes into effect January 1, 1908. These will be Albany, Rochester, Troy, Utica, Schenectady, Syracuse, and Yonkers, each having a population of more than 50,000 and less than 250,000, which, according to the State Constitution, entitles them to this rank, although Rochester may be advanced to first-class if the constitutional amendment is adopted which provides for the entrance of cities of 175,000 into that grade. Under the new charter heads of departments are required to file annual reports with the Mayor by the first Monday in December of each year. The time limit at present is the first Monday in November. The budget may be adopted by a majority vote of all the members of the Common Council. Now a three-fourths vote of all members is required. A little more power is given the Acting Mayor (President of the Common Council). Under the new charter, if the Mayor shall be absent from the city or sick, so as not to be able to attend to his official duties for a period

of nine days, the Acting Mayor may sign, approve or disapprove any ordinance or resolution of the Common Council. The Acting Mayor cannot exercise any power of appointment or removal from office unless the Mayor's sickness or absence shall have continued for a period of thirty days. Under the present charter the Acting Mayor cannot exercise any of the Mayor's power as to appointment or removal or signing ordinances or resolutions until the end of the thirty-day period.

CARBONDALE, ILL.—The City Council recently notified the Citizens' Light and Power Company that after December 3, Carbondale would be unable to accept water and light service, for the reason that the city is out of funds and unable to pay. The Mayor has also discharged all but one police officer. The cause for the financial difficulties is assigned to the closing of the saloons, making revenue from that source no longer available.

OKLAHOMA CITY, OKLA.—A committee of business men investigating the commisson form of municipal government has recommended that this city immediately take steps to adopt that method of conducting city affairs. According to the new constitution any city of 6,000 or over in the State may vote to adopt the commission form of government. This creates the office of Mayor and four Councilmen. The official body is to be elected by the people-at-large. Salary of $2,500 for the Mayor, and $1,500 for Councilmen, was recommended.

The $250,000 bond issue recently voted for extensions of water works and sewers has been sold to R. J. Edwards, a local bond broker, representing Eastern capital. The bonds are dated October 1, and will run thirty years, with interest at 5 per cent.

PITTSBURG, PA.—Twelve more boroughs, having an approximate population of 69,000 people, are in line for merging with the greater city under the Goehring Act, or Greater Pittsburg bill, and indications are that they will follow Allegheny, Sheraden, and other recent acquisitions. Petitions are being circulated in some of the boroughs asking that a vote be taken on the proposition.

SIOUX CITY, IA.—Nearly 2,000 signatures have been obtained endorsing the adoption of the Galveston-Des Moines plan of city government in this city.

SALT LAKE CITY, UTAH.—Council has ordered that an inventory of all the property owned by the city be taken by the heads of the various city departments, and the results reported to the Finance Committee of the Council before December 31. This action has been taken because a number of years have elapsed since the city has required an inventory of its property, and that it is needed now in order that the new set of books being made out by the special accountants who have been examining into the condition of the city's affairs may be begun properly. The new system will be put in force January 1.

Refuse Collection and Disposal

GRAND RAPIDS, MICH.—The Board of Health has instructed the Health Officer to secure lists of all persons, other than city employees, who are collecting garbage in the city, and such persons have been notified that they must stop such collections. All hotel and restaurant keepers have also been notified that no one but a regularly employed city employee shall collect their garbage. No one other than city employees will be permitted also to cart garbage in the city limits.

PROVIDENCE, R. I.—A form of contract has been adopted by the Board of Aldermen under which bids will be invited by advertising, for the collection of garbage and house offal. The form provides that the contract shall begin on May 1, 1908, and run for a period of five years. The contractor is to provide his own vehicles for transportation. Twice each day, except on Sundays, the contractor is to call at the Office of the Superintendent of Health to receive complaints. He is not to keep swine or carry on a rendering establishment within one mile of the city. The right is reserved to terminate the contract at any time when its terms are not lived up to. A bond of $10,000 is to be required. The contract is not to be construed as granting an exclusive right or privilege to remove or carry garbage through any public street or as preventing the Board of Aldermen from appointing and licensing persons to so remove garbage or house offal.

TACOMA, WASH.—Herbert S. Griggs, attorney for the St. Paul and Tacoma Lumber Company, has served legal notice upon the Mayor, City Council and other city officers ordering the city to cease dumping garbage on the tideflats near the mill. The company demands $2,000 damages from the city for the dumping that has already been done and $1,000 additional for each day that the practice is continued. Unless the Commissioner orders the dumping of garbage to cease the company, through its attorney, will apply to the courts for a restraining order enjoining the city from using the tideflats near the mill for a garbage dump. The city dump has been driven from one location to another by reason of the complaints of the citizens, and Commissioner of Public Works Owen Woods is anxious that Council decide to build a garbage incinerator.

Parks and City Beauty

BALTIMORE, MD.—The proposed extension of Howard street, as recommended by Messrs. Olmsted, Carrere, and Brunner, the experts called in to advise upon this project by the joint committee of the Municipal Art Society and the Merchants' and Manufacturers' Association, which has the movement in charge, involves a broad boulevard leading to a big circle south of the Fifth Regiment Armory and between it and the Mount Royal Station park. The boulevard will be parked, and a parade ground established in front of the Armory. Avenues leading to Mount Royal Station will be opened and the street lines changed somewhat. A slight rearrangement of car lines is also contemplated. It is proposed to have the city purchase all the territory involved in this plan, with the idea of reselling the property abutting on the boulevard and circle and profiting by the increase in values which will ensue.

JANESVILLE, WIS.—Dr. C. G. Dwight has presented to the Twilight Club detailed plans for a system of boulevards, parks and driveways through the central part of the city, which it is believed would greatly enhance the beauty of Janesville. Dr. Dwight advocates the organization of the people under charter 55 of the State law, which provides for the organization of public corporations for the purpose of creating and maintaining parks, drives and boulevards, and he has prepared plans which show what could be accomplished under the careful and judicious direction of the proposed Janesville Park and Pleasure Drive Association. He also states there are many miles of beautiful river front that might be acquired for a small amount by an association, to be used for the benefit of the people, and which would promote the welfare of the city.

OAKLAND, CAL.—The Finance Committee has adopted the suggestion of the Clinton Improvement Club, to purchase private property on the east side of the marsh land to be reclaimed south of the Twelfth street dam. It is contemplated to establish a chain of parks to surround Lake Merritt, which will complete one of the most extensive natural playgrounds in the West, and Mayor Mott, City Engineer Turner, members of the Council and East Oakland residents are enthusiastic over the

plan. It is proposed to build an eighty-foot boulevard along the land to be purchased, bordering the channel running south from the lake. This will complete the extension of the boulevard system from Twelfth street to the Clinton local station. The remainder of the property is to be improved by a landscape gardener, to conform with the parks bordering the lake on all sides. Land on Fallon street, on the opposite shore, is to be purchased and improved.

PHILADELPHIA, PA.—In its nineteenth annual report, just issued, the City Parks Association presents its plan for a complete park system, which has been worked out after several years of careful examination; it extends in its plans to every part of the city, and includes boulevards, playgrounds, recreation-piers, and parkways. The report is accompanied by a map which shows all the parks, present, recommended, or projected. The object of the association is stated to be to provide a plan that will give Philadelphia adequate parkways for this and the next generation, and covers in its scope the areas of the Schuylkill River and Pennypack, Tacony, Cobb's, Mill and Wissahickon creeks, with their branches, all within a radius of seventeen miles of the City Hall. Playgrounds are urged to be of such a number as to be within five minutes' walk of every child, with large recreation centers every mile for the larger boys and girls.

PUYALLUP, WASH.—Park Superintendent E. R. Roberts, of Tacoma, recently visited Puyallup, consulting with the Mayor and the City Council in regard to making extensive improvements on the city park. With Mayor McMillan and Councilmen Wyllis, Carter, Porter and Westcott, he went to the park and looked it over. Mr. Roberts suggested planting a great deal of shrubbery, such as hemlock, fir, cedar and dogwood, at random throughout the park and then to have a number of outside entrances with walks leading from them to the center of the plot. In the center, he said, should be placed a large fountain throwing a stream of water about forty or fifty feet high, but Mayor McMillan does not think there is enough water pressure to accomplish such results. Several members of the Council are in favor of constructing concrete walks if improvements are made.

Rapid Transit

DETROIT, MICH.—Council has under consideration a resolution presented by Mayor Thompson for a 24-second car service. The Committee on Franchises has reported in favor of the resolution. It applies to the five-cent lines only.

JERSEY CITY, N. J.—Mayor Mark M. Fagan recently sent to the Street and Water Board a copy of the new "no-seat-no-fare" ordinance, which he suggested be enacted so that the Public Service Corporation may be forced to provide more cars, and it was passed on its first reading. The new ordinance is to supplement the ordinance passed last winter requiring proper trolley accommodation at the Erie ferry and Exchange place terminals, which was recently upheld by the State Supreme Court. The new ordinance is to require the trolley companies to operate upon their several lines a sufficient number of cars to accommodate with a seat thereon, at any time of the day, and in every part of the city, all passengers desiring transportation, without obliging such passengers to wait for such transportation longer than a reasonable length of time. Fines of $50 are provided. The present "no-seat-no-fare" ordinance applies only to cars running from the Pennsylvania and Erie Railroad terminals between the hours of 5:30 P. M. and 7 P. M. The Mayor, in a letter accompanying the proposed ordinance, said experience has taught that the trolley company will make no real attempt to abolish the strap-hanging nuisance and the evils of overcrowding on their cars unless they are compelled to do so by the most stringent regulations and by the imposition of money penalties.

By direction of Corporation Counsel G. L. Record, half a dozen detectives were recently sent out on the trolley cars of the Public Service Corporation to make a case on the no-seat-no-fare ordinance. In every case they refused to pay fares when they were compelled to stand up. They boarded nearly a dozen cars, and were put off each time.

OKLAHOMA CITY, OKLA.—The local street railway company has destroyed all passes and passbooks on its line, and now everybody must pay. This includes newspaper men, firemen, policemen, mail carriers and others who have been enjoying the hospitality of the railway company.

ORANGE, N. J.—The ordinance providing for the arrest of offenders who fail to stop the cars for prospective passengers is to be stringently enforced, a resolution having been passed by Common Council directing the Chief of Police to instruct his men to arrest motormen who fail to stop at street crossings when signaled.

Miscellaneous

GRAND RAPIDS, MICH.—That it might more expeditiously and economically complete the work on the West Side ditch sewer, the National Construction Company, which was awarded the contract, recently sent a communication to the Board of Public Works requesting that an advance of $8,000 be granted to the company with which to meet its obligations to local creditors. This amount is to be taken from the amount returned under the 15 per cent. clause of the company's contract. The company also guarantees to protect the city by the extension of its bond. A request was also made that hereafter estimates be paid to the company covering the full amount of the work performed. The request was granted and sent to the Council for ratification.

KANSAS CITY, MO.—To remedy Kansas City's deficiency in public baths, it is proposed that a set of tubs and showers be open, perhaps at a nominal charge, the year through. It is planned to erect two or more bathhouses at different locations in the north part of the city.

NEW YORK, N. Y.—The design for the Hudson Memorial Bridge, a most ornate and pretentious span and one of the most remarkable and beautiful in the world from an engineering standpoint, has been submitted to the Municipal Art Commission by Bridge Commissioner James W. Stevenson. The notable feature in the design is that the bridge will contain an arch 710 feet long, twice as long as that in the next biggest bridge in the world. The total length of the bridge will be 2,085 feet and it will rise nearly 200 feet from the ground. It is to cross the valley between Inwood Heights and the Riverside drive at Spuyten Duyvil, and will cost between $3,000,000 and $4,000,000.

TOLEDO, O.—The Board of Public Service has ordered advanced to Garrigan Brothers the sum of $11,522.46 so the firm can proceed with the paving of Summit street beyond Riverside park. The city was obliged to inaugurate somewhat of an innovation by advancing money to a contractor so he would carry out the provisions of his contract, because Garrigan Brothers were unable to secure funds on account of the closeness of the money market. Had the city not advanced the cash the street might have been partially paved all winter, and the Service Board wanted to prevent this. The Garrigans will pay the city six per cent. interest for the use of the money.

TROY, N. Y.—Council has repassed over Mayor Mann's veto the ordinance providing that electrical signs might extend beyond buildings over the sidewalk a distance of four feet, instead of eighteen inches.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Municipal Interest

SPEED REGULATIONS

People ex rel Hainer vs. **Keeper of Prison of Seventh Dist. Magistrates Court et al.**—The State laws of 1904 forbid a greater rate of speed for motor vehicles in closely built up districts than a mile in six minutes and provide that local authorities may regulate the speed of motor and other vehicles on an equal basis; further, that on roads where speed is regulated signs indicating the limit should be conspicuously placed. New York City passed a speed ordinance, but failed to put up signs. A case coming up, it was held that the failure to comply with the conditions relating to sign boards was fatal to the ordinance, so that the penalties described therein did not supersede those elsewhere provided, and that the city was not entitled to a summary trial before a City Magistrate, but could be held for trial before the Court of Special Sessions.—New York Supreme Court, Appellate Division.

OBSTRUCTION IN SIDEWALK

Corr vs. **City of New York.**—The liability of a municipal corporation for injuries sustained in stumbling over the top of a manhole, whose top extended from three to six inches above the surface of the sidewalk, held to be a question for the jury. An obstruction, caused by commission, standing upright in the traveler's usual way to the height of from three to six inches, and so existing for four months or more, is not within the rule that a municipality cannot be held liable for defects so slight that an ordinary prudent man would not regard them as dangerous defects, which should be remedied within a reasonable time.—New York Supreme Court, Appellate Division.

ESTABLISHMENT OF STREET

Appeal of Gray et al.—The charter of the city of Hartford makes it the duty of a committee, appointed to hear an appeal in proceedings for the laying out of a public street and apportionment of damages and benefits, to apportion the whole amount of the damages and benefits in case he finds cause to alter the appraisal or assessment. Held, that this involves a determination by the committee of all questions of law and fact raised by the appeal essential to finding whether there was cause for reapportionment, and his report cannot be set aside merely because he has made such rulings upon questions of law, but only in case of improper rulings. Questions as to dedication and acceptance of a public street are questions of fact. The report of a committee to hear an appeal in proceedings to lay out a public street and to apportion damages and benefits will not be set aside or recommitted because of a mere harmless error or improper finding of an immaterial fact.—Supreme Court of Errors of Connecticut.

USE OF STREETS

Hatfield vs. **Straus.**—One occupying his property abutting on a street as his private residence held entitled to sue to restrain the construction of a railroad track thereon. Greater New York City Charter, Laws 1901, as amended by Laws 1905, held not to authorize the Board of Estimate and Apportionment to grant to the owners of a department store the right to construct and operate a spur track in a street to be used exclusively for the transportation of its goods.—Court of Appeals of New York.

COMPENSATION OF CORPORATION COUNSEL

Sutherland vs. **City of Rochester.**—A judgment foreclosing liens held by a city, directing a sale of land and adjudging that the Corporation Counsel shall be paid his taxable costs out of the proceeds before the city is paid, fixes the order of payment, and that question is not open for review in an action by the Corporation Counsel against the city for the costs. Under the Rochester City Charter, Laws of 1898, providing that the Corporation Counsel shall be entitled in actions in which the city shall be successful to costs collected from the adverse party, the Corporation Counsel, on the city succeeding in an action to foreclose tax liens, is entitled to the taxable costs, though it became the purchaser of the land.—Court of Appeals of New York.

ABANDONMENT OF STREETS

City of Chicago vs. **Illinois Steel Co.**—Where, from the filing of plats of a city addition in 1852 and 1856, nothing further was done toward building up the addition, and thereafter steel mills were erected encroaching on the streets, and the mill company and its successors had exclusive, open, and uninterrupted possession of the streets in controversy from 1859 to the commencement of the suit in 1903, and the city stood by in silence and knowingly permitted defendant to invest large sums of money on the belief that the street had been abandoned, the city was equitably estopped from thereafter insisting that defendant's structures constituted an obstruction to the streets. Though municipal corporations are not within statutes of limitation, except as to private rights, equity will prevent the operation of the rule by enforcing an equitable estoppel.—Supreme Court of Illinois.

LEASE OF SUBWAY

City of New York vs. **Interborough Rapid Transit Co. et al.**—The subway in the city of New York being the property of the city, the use thereof by a lessee of the city was limited to railroad purposes, and the use of any of the ducts for the sale and transmission of electric currents for motive power to third parties, whether the owners or operators of connecting or intersecting railways or not, is not one of such uses, and will be restrained by injunction, though the lease contains no express prohibition against it, but has no express grant of such right.—Supreme Court of New York.

RIGHT TO SUPPLY WATER

City of Rochester vs. **Rochester & Lake Ontario Water Co. et al.**—Where a water company was authorized to maintain its mains through a city to furnish water to other towns, and a railroad company, on whose right of way the mains were laid, was authorized by Laws 1890 to acquire a necessary water supply, the water company could, without the consent of the city, furnish water to the railroad company for use as such within the city under private contract. Where a water company, maintaining conduits from its source of supply through the city of Rochester, had not acquired a valid franchise to furnish water to consumers along the lines of its conduits prior to the passage of Laws 1903, giving the city a monopoly of the right to furnish water to its residents, such act was applicable to the corporation and prevented it from furnishing water to consumers in Rochester without the city's consent.—Court of Appeals of New York.

WATER DEPARTMENTS

Commonwealth ex rel. Carson, Attorney General, vs. **Heller et al.**—The act of May 23, 1889, allowing any city of the third class owning water works to create a Department of Water, is not unconstitutional as special legislation because the city of Erie, owning water works, was excluded. While the classification which permanently excludes even one member of the class from its future operation is unconstitutional as special legislation, the fact that by the statute existing exceptions are not immediately abolished does not destroy the constitutionality of the act. The act of May 23, 1889, providing for the establishment of Water Departments in cities of the third class, is not mandatory, and does not repeal the local act of March 21, 1865, creating a Water Department for the city of Reading.—Supreme Court of Pennsylvania.

WATER RATES TO EDUCATIONAL INSTITUTIONS

City of Chicago et al. vs. **University of Chicago.**—In an action to enjoin the city from cutting off the water supply of an educational institution for non-payment of water taxes, where the answer avers that the city has full right to make reasonable charges and to designate institutions to which it will furnish water free, and the case is heard on that theory, the city cannot, on appeal, contend that ordinances providing for remission of water rates to charitable and educational institutions are invalid.—Supreme Court of Illinois.

SPECIAL ASSESSMENTS—PROCEDURE

Village of Franklin Park vs. **Franklin.**—Under the statute providing that the hearing in special assessment proceedings shall be conducted as cases at law, the rule in cases at law governing the taking of bills of exceptions applies to such proceedings. A part of a bill of exceptions in a special assessment proceeding held not properly a part of the bill, and would be expunged on motion.—Supreme Court of Illinois.

TAXATION OF CORPORATIONS

City of Harrisburg vs. **Harrisburg Gas Co.**—The act of March 19, 1860, and act of April 22, 1868, authorizing the city of Harrisburg to tax corporations for city purposes, were repealed by the act of May 23, 1874, and the act of May 23, 1889, providing for the creation of cities of the third class and for a complete system of taxation therein.—Supreme Court of Pennsylvania.

TAXATION OF LAND

People ex rel. Browning, County Collector, vs. **St. Louis, A. & T. H. R. Co. et al.**—It was improper for the Board of Review in 1905 to increase an assessment of land made in 1903 on account of supposed increase in value of underlying coal and mineral through the location of a mine on other land in the vicinity. There being no appropriation ordinance in force when a tax levy ordinance is passed, the tax levy ordinance is void.—Supreme Court of Illinois.

REMOVAL OF CITY MARSHAL

Stebbins vs. **Police Commission of City of Springfield.**—Under the Springfield City Charter, providing that the administration of police shall be vested in the Mayor and Aldermen, who shall have exclusive power to appoint police officers "and the same to remove at pleasure," the Mayor and Aldermen had the absolute power to remove the City Marshal and his assistant, without notice or hearing.—Supreme Judicial Court of Massachusetts.

PROMOTIONAL EXAMINATIONS

People ex rel. Williams vs. **Errant et al.**—Under the Chicago Civil Service Act, providing that, where practicable, vacancies shall be filled by promotion, where there are at least fifteen persons eligible for promotion to a vacancy, mandamus will lie to compel the commissioners to hold a promotional examination.—Supreme Court of Illinois.

FINAL AND CONCLUSIVE

In re Village of Cedarhurst.—The words "final and conclusive," as used in a statute declaring orders of the County Court made in special proceedings appealed from a decision of a Town Supervisor final and conclusive, mean that there should be no appeal from the order.—New York Supreme Court, Appellate Division.

UNANIMOUS VOTE DEFINED

Bussing vs. **City of Mt. Vernon.**—Though a city's charter requires "a unanimous vote" of all the members of the Council to authorize a street improvement, an improvement proceeding and an assessment were not void because there was a unanimous vote of only eight members, all that were present; the whole number being ten.—New York Supreme Court, Appellate Division.

ADVERSE POSSESSION

Town of El Dorado vs. **Ritchie Grocery Co.**—Where land donated to a town for street purposes, on condition that it survey the same and lay out streets thereon and keep them in good condition, was thereafter, on failure to perform such condition, conveyed to another, and for more than seven years held adversely to the town, and permanent and valuable improvements put thereon, title was in the occupant, and not the town.—Supreme Court of Arkansas.

ITINERANT PHYSICIAN'S LICENSE

City of Fairfield vs. **Shallenberger.**—The State may, in the exercise of its police power, require a State license for the practice of medicine, and at the same time authorize municipalities to require a license for the practice thereof within their boundaries. A city ordinance requiring a license tax of itinerant physicians is not subject to the objection that it discriminates in favor of resident and against nonresident physicians; both being subject to the charge. A license tax of $50 per year imposed by a city ordinance on itinerant physicians is not per se unreasonable.—Supreme Court of Iowa.

CONDEMNATION FOR STREET PURPOSES

City of Grafton vs. **St. Paul M. & M. Ry. Co. et al.**—In an action by a municipality to condemn property for street purposes, it is unnecessary to allege or prove the public necessary for such street. The power to determine this question has been expressly delegated to the legislative department of such municipalities, and its determination is conclusive. The only question of necessity for the court to determine is as to whether the particular property sought to be condemned is necessary for such public use.—Supreme Court of North Dakota.

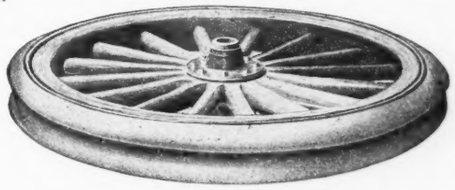
MUNICIPAL APPLIANCES

Paving Blocks from Destructor Refuse

CONSIDERABLE success is being attained by the Borough Council of Kensington, England, in the manufacture of paving blocks from destructor refuse, asphalt being used as a binding material. The experiments began four years ago, and the results have justified expectations, as the blocks are being manufactured for three shillings a yard. When working under favorable conditions upwards of 500 clinker paving blocks per hour have been turned out. The process is the same as that in ordinary use in the United States for manufacturing asphalt blocks. In England the Sanitary Block and Tile Pavement Company has the sole concession for the use of Trinidad asphalt in the form of paving blocks, and they are ready to grant to local authorities the right to make blocks like those turned out at Kensington.

New Tire for Fire Apparatus

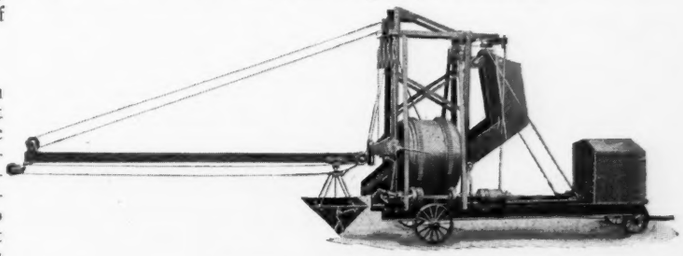
A DOUBLE rubber tire for use on fire apparatus has been put on the market by the Firestone Tire and Rubber Company, of Akron, O. As shown in the cut, the new tire is formed by placing two single tires side by side on the same wheel. Although a novelty for fire apparatus, this device has been used with great success upon the heaviest commercial vehicles. The advantage is that the double tire will stand hard usage for a much longer time than the single. Moreover, the dual tread feature prevents skidding when the vehicle turns corners at high speed and affords greater resilience by allowing more escape for the rubber under pressure.



DUAL FIRESTONE TIRE

Concrete Mixer for Street Work

A CONCRETE mixer designed to deliver material on the face of the work in laying concrete foundations for street pavements as well as for other purposes, has been placed on the market by the Koehring Machine Company, Milwaukee, Wis. The machine consists of a gasoline engine, an automatic loading and measuring box, a rotary drum and a bucket moving back and forth on a distributing track. All these, except the carrier, are mounted on a frame of 10-inch channels, supported on trucks provided with a traction drive for moving the mixer along the line of the work. The loading bucket, shown in the cut in its elevated position as in delivering material into the mixer, is divided longitudinally into two positions so that stone can be shoveled in on one side and sand and cement on the other. The mixing drum delivers the mixed concrete into a bucket, holding three-quarters of a yard, which travels on an I-beam distributor 24 feet long, which can be moved sideways by means of a universal joint so as to deliver over the whole street or elevated when used for special purposes. The bucket can be dumped so as to partially spread its contents, and, as compared with the work of a machine without a delivering apparatus, considerable economy in labor over the use of men wheeling may be effected.



KOEHRING CONCRETE MIXER

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals

ROADS AND PAVEMENTS

Street Paving Suggestions. Abstract of article in Municipal Journal and Engineer by T. Chalkley Hatton. 3 pp. Pacific Municipalities, October.

Progress in Street Paving and Cleaning. Report of a committee of the American Society of Municipal Improvements. By Clarence D. Pollock. 3-4 p. Good Roads, November.

Street Paving in St. Louis. 1-3 p. Municipal Journal and Engineer, November 27.

Paved Roads, Cuyahoga County. 2 pp. Good Roads, October.

Destructor Refuse, Road Paving from. A successful Kensington experiment. 1-3 p. Local Government Journal, October 26.

Good Roads for the People. By W. Pierrepont White. 8 pp. Illustrated, Outing, November.

Object Lesson Roads Built by the Government and their Cost. 1 p. Engineering-Contracting, November 20.

Modern Highway. Editorial. 1-2 p. Engineering Record, November 23.

Dust Prevention. Judge's report on Roads Improvement Association's tar trials. 2 1-2 pp. Surveyor, November 1.

Oil Emulsions on Macadam Roads. By M. H. West. 1 p. Good Roads, November. 1 1-3 pp. Park and Cemetery, November.

Road Hardening and Dust Prevention about Boston. Paper read before the Massachusetts Highway Commission by John R. Rablin. 2 pp. Engineering Record, November 23.

Wood Paving Blocks, Requirements for Treating. Paper read before the American Society of Municipal Improvements by George W. Tillson. 2 pp. Engineering Record, November 16. 5 pp. Municipal Engineering, November. 2 pp. Municipal Journal and Engineer, November 6.

Paving Bricks, Requirements and Tests for Quality of. By J. W. Howard. Paper read before the American Society of Municipal Improvements. 2 1-2 pp. Municipal Engineering, November. 1 p. The Surveyor, October 25.

Testing of Clay Products. By W. D. Richardson. 4 pp. Illustrated. Brick, November.

Mechanical Spreader for Roadway Screenings. 1-4 p. Engineering Record, November 9.

Density of Pavements. Abstract of paper read before the American Society of Municipal Improvements by J. W. Howard. 1-2 p. Engineering Record, November 23. 1-3 p. Engineering-Contracting, November 27.

Concrete Pavement, Methods of Constructing, at Windsor, Ont., with notes on cost. 2-3 p. Engineering Contracting, November 20.

Paving Selection and Assessment. 1-2 p. Municipal Journal and Engineer, November 27.

Ownership of Street, Value of. 1 p. Real Estate News, November.

Pavement Guarantees. Editorial. 1 p. Municipal Engineering, November.

Guarantee Clause in Paving Specifications. By John B. Hittell. Paper read before the American Society of Municipal Improvements. 4 pp. Municipal Engineering November.

Contractor on Guarantees. Comments on address before American Society of Municipal Improvements by W. N. Andrews. 1-2 p. Municipal Journal and Engineer, November 6.

Repair Plant, Municipal Paving. First annual report of plant at New Orleans, La. 5 pp. Illustrated. Municipal Journal and Engineer, November 6.

Back-filling Trenches. By George C. Warren. Paper read before the American Society of Municipal Improvements. 3 1-2 pp. Municipal Engineering, November.

Traffic Records on Selected Streets of New York City. By J. W. Howard. 2-3 p. Engineering-Contracting, November 20. 1-3 p. Engineering News, November 7. 1 p. Municipal Journal and Engineer, November 13.

Traffic on New York Streets. Communication from Eli White. 2-3 p. Engineering Record, November 9.

Traffic Regulations, Street. 1 p. Municipal Journal and Engineer, November 20.

City Sidewalk, Planning and Improving the. From an address by F. L. Ford. 2 pp. Pacific Municipalities, September.

Concrete Curb, Method of Building. 1-3 p. Engineering-Contracting, October 30.

Street Signs, Sidewalk. By Charles James Fox. 2-3 p. Architects' and Builders' Journal, November.

SEWERAGE AND SANITATION

Sanitary Engineering. Paper read before the Union of Alberta Municipalities. By R. B. Owens. 7 pp. Canadian Municipal Journal, November. 3 pp. Western Municipal News, November.

Nation's Housekeeping at Panama. By Gertrude Beeks. 5 pp. Outlook, November 2.

Sanitary Authorities, National Union of. Proposed organization of such a society. 4 pp. Public Health, November.

City Regulations Concerning Packing House Odors. Protected stenches in Chicago. Alfred Brand. 2-3 p. Real Estate News, November.

Pollution of the Hudson. Abstract of bulletin of the New York State Department of Health. 2-3 p. Fire and Water Engineering, November 13.

Milk Handling, German. Abstract by Consul T. H. Norton, Chemnitz, of addresses before the German Association of Scientists and Physicians by Prof. Hempel. 3 pp. Daily Consular Reports, November 5.

Problems of Pure Milk. Extracts from Medical Record quoting Commissioner Darlington, of New York. 2-3 p. Literary Digest, November 16.

Control of the Milk Supply in American Cities. By C. H. Tattersall. Public Health, November.

Sanitary Authorities and Milk Supply. By Edward Sergeant. 4 pp. Journal of the Royal Institute of Public Health, November.

Tuberculosis, Papers on, at the Berlin Congress. 4 pp. Public Health, November.

International Congress on Tuberculosis. By Cardinal Gibbons. 1 1-2 pp. Charities and Commons, November 2.

Eradication of Tuberculosis from a National Standpoint. Paper read before the Congress at Douglas by E. W. Diver. 7 pp. Journal of the Royal Institute of Public Health, November.

Phthisis, Prevention of. By Charles Wills. 10 pp. Journal of the Royal Institute of Public Health, November.

Administrative Control of Phthisis in Scotland. Extract from report of the Local Government Board of Scotland. 4 pp. Public Health, November.

Typhoid, Spread of. Communication from the Secretary of the Indiana State Board of Health, J. N. Hurty. 1-3 p. Water and Gas Review, November.

Sewage, Domestic, Manufacturing Wastes and Storm Water in Gera. By Civil Engineer Geissler, of Gross-Lichterfelde. 6 1-2 pp. Gesundheits-Ingenieur, November 2.

Sewage Disposal. 1 1-2 pp. Municipal World, November.

Sewage Disposal by Dilution. Editorial. 1-2 p. Municipal Journal and Engineer, November 20.

Progress in Sewage Disposal. Report of Committee on Sewage of the American Society of Municipal Improvements. By C. H. Rust, Chairman. 2 1-2 pp. Municipal Engineering, November.

On the Mechanism of Biological Purification of Sewage by Bacterial and Percolating Filters. Paper read before the Association of Architects and Municipal Sanitarians by Dr. A. Calmette. 30 pp. Technique Sanitaire, September and October.

Some Interpretations of Sewage Purification Phenomena. Paper read before the Incorporated Association of Municipal and County Engineers by Sidney H. Chambers. 6 pp. Illustrated. Water, November 15. 10 pp. Illustrated. Contract Journal, October 30. 7 pp. Illustrated, Surveyor, November 1.

Percolating Beds, Passage of Liquid Through. Paper read before the Society of Chemical Industry by William Clifford. 1 p. Water, November 15.

Sterilization of Treated Sewage. Abstract of a bulletin of the U. S. Bureau of Plant Industry. 2 pp. Engineering Record, November 16.

Disinfectants, Studies of Sewage. Abstract of a bulletin of the Bureau of Plant Industry. 1-3 p. Engineering News, November 21.

Reading, Pa., Sewage Disposal Plant of. 5 pp. Illustrated. Municipal Journal and Engineer, November 6.

Kew Beach, Toronto, Ont., Sewage Disposal Plant at. By C. H. Rust. Paper read before American Society of Municipal Improvements. 3 1-2 pp. Illustrated. Municipal Engineering, November. 2-3 p. Engineering Record, November 9.

Kew Beach Sewage System, Toronto. By W. Hollingsworth. 2 pp. Illustrated. Canadian Architect and Builder, October.

Kingston-on-Thames, Sewage Works at. 1 1-3 pp. Contract Journal, October 23.

Association of Managers of Sewage Disposal Works. Visit to Kingston-on-Thames. 1-2 p. Sureyor, October 25.

Bushbury Sewerage and Sewage Disposal Works. 1-2 p. Illustrated. Contract Journal, October 30.

Calumet District, Report on Sewage Disposal of the, Through the Chicago Drainage Canal, by Hering and Fuller. 1 1-2 pp. Engineering News, November 7.

Sewers, Reinforced Concrete. 1 p. Illustrated. Concrete and Constructional Engineering, November.

Ingleside Sewer, Borough of Queens, New York City. 1 p. Illustrated. Engineering Record, November 9.

Cost Keeping on Sewer Work. By Keith O. Guthrie. 3-4 p. Engineering-Contracting, October 23.

Pumping Machinery, Sewage. 3 pp. Illustrated. Municipal Journal and Engineer, November 27.

Alignment, Sewer. 1-2 p. Illustrated. Municipal Journal and Engineer, November 6.

Computing, Sewer Discharges, Short Method of, for a Changed Value of n in Kutter's Formula. By G. S. Coleman. 2-3 p. Engineering News, November 21.

WATER SUPPLY

Description of Water Supply System of Reading. 1 p. Illustrated. Fire and Water Engineering. November 13.

Springfield Water Works. By Elbert E. Lochridge. 19 pp. Illustrated. Journal New England Water Works Association, September.

New Water Supply Tunnels at Chicago. 3 pp. Illustrated. Engineering News, November 14.

Augusta, Ga., Water Works and Fire Department. 2-3 p. Fire and Water Engineering, November 13.

Some Notes on Oriental Water Works. Condensed from paper read before the American Water Works Association by George A. Johnson. 3 1-2 pp. Illustrated. Engineering News, November 7.

Water Supply and Sewerage of the New Industrial Town of Gary, Ind. 1 p. Engineering News, November 7.

Water Works Changes at Nashville. 1 p. Fire and Water Engineering, October 30.

Projected Water Supply for the City of Lyon. Paper read before the Association of Architects and Municipal Sanitarians by Drs. Calmette, Launay and Imbeaux. 2 pp. Technique Sanitaire, September-October.

Water Supply for the Town of St. Etienne and the Project for Using the Waters of the Lignon for the Production of Electrical Energy. Paper read before the Association of Architects and Municipal Sanitarians by Paul Lévy-Salvador. 4 pp. Technique Sanitaire, September-October.

Zigzag Through the Rock. Account of the Tunnel for the Aqueduct Under the Hudson River. 1 1-2 pp. Water and Gas Review, November.

Relation of the Municipality to the Water Supply. A symposium. Conditions in 12 large cities described. 36 pp. Annals of American Academy of Political and Social Science, November.

Small Towns, Water Supplies for. By Gerald McCarty. 1 1-3 pp. Fire and Water Engineering, November 27.

Statistics, Water Works, for the year 1906, in form adopted by the New England Water Works Association. Compiled by Charles M. Sherman. 23 pp. Journal New England Water Works Association, September.

Water Supply of the United Kingdom. 14 pp. Quarterly Review, October.

Census Bureau on City Water Works. 3 pp. Public Service, November.

Artesian Water Supply of Australia. By C. O. Burge. 1 p. Engineering Record, November 16.

Camden's Artesian Water Supply. Showing that it is not derived from the Delaware River by Infiltration. By Prof. Oscar S. C. Carter. 16 pp. Illustrated Journal of the Franklin Institute, November.

Deep-Well Water Supply. Paper read before the Central Water Works Association. By John Langan. 2-3 p. Fire and Water Engineering, November 13.

Reservoir Dams, Views of Recent, of Various Countries. 11 pp. Illustrated. Technique Sanitaire, September-October.

Cataract Dam, Sidney, New South Wales. 4 pp. Illustrated. Water, November 15.

Method and Cost of Building a Reinforced Concrete Reservoir. 3 pp. Engineering Contracting, November 6.

Reinforced Concrete in Reservoir Construction. By E. R. Matthews. 4 pp. Illustrated. Concrete and Constructional Engineering, November.

Methods and Cost of Making Two Hydraulic Fill Dams. 3 pp. Engineering-Contracting, November 13.

Purification of Water in Large Reservoirs. 1-2 p. Revista Municipal, November 1.

Purifying Water by Nature's Method. By T. Everett Harry. 2 pp. World To-day, November.

Protection of Public Health by Means of Sand Filtration. Paper read before the Association of Architects and Municipal Sanitarians by H. Chatal. 6 pp. Illustrated. Technique Sanitaire, September-October.

Report on the Filtration of the Croton Water Supply, New York City. 2 pp. Illustrated. Engineering News, November 21. 4 pp. Illustrated. Engineering Record, November 23.

Filtration for the Croton Water Supply, New York City. 1 p. Engineering News, November 21.

Removal of Manganese from Deep Well Water. Experience in Arad, Hungary. 2-3 p. Engineering Record, November 9.

Pollution in the Oswego and Upper Hudson River Drainage Areas. Abstract of a bulletin of the New York State Board of Health. 1 1-3 pp. Engineering News, November 7.

Lead in Drinking Water. Abstract of report to the Local Government Board by Dr. W. W. Fletcher. Water, November 15.

Measuring Water to Large Consumers. Paper read before the Association of Architects and Municipal Sanitarians by M. A. Claus. 7 pp. Technique Sanitaire, September-October.

Rates for Water Service. Presidential address by Dabney H. Maury before the American Water Works Association. 2 pp. Western Municipal News, November.

Pumps, Centrifugal. Some reasons why modern designs are more efficient. By E. F. Doty. 2 1-2 pp. Illustrated. Engineer, November 1.

Chicago Avenue Pumping Station. Capacity 75,000,000 gallons daily. By Henry W. Allen. 5 pp. Illustrated. Engineer, November 15.

Valuation of Water Works Properties. Abstract of paper by Charles B. Burdick read before the Wisconsin League of Municipalities. 3 pp. Engineering-Contracting, October 23.

Ashokan Reservoir Bids. Editorial. 1-2 p. Engineering News, November 21.

Report of Advisory Board of Engineers on the Ashokan Reservoir Contract. 2-3 p. Engineering-Contracting, November 20.

Probing the Ashokan Dam Contract. 2-3. Fire and Water Engineering, November 27.

Water Rights. By Richard A. Hale. 13 pp. Journal of the New England Water Works Association, September.

Conservation of Water. 1-3 p. Engineering Record, November 23.

Punishment for Waste of Well Water in California. Account of case to test legality of recent legislative act. 2 pp. Engineering Record, November 9.

Study and Experiences in Regard to Municipal Water Supplies. Paper read before the Association of Architects and Municipal Sanitarians by M. Gaudillon. 4 pp. Illustrated. Technique Sanitaire, September-October.

Architecture and Landscape Work for the Catskill Water Works. 2-3 p. Engineering Record, November 16.

Corrosion of Iron Pipes by Stray Currents, Relation Between Polarization and the. By Irving Langmuir. 16 pp. Illustrated. Stevens Institute Indicator, October.

STREET LIGHTING AND ELECTRIC POWER

Electric Street Lighting in the City of New York. By H. T. Owens. 1 1-2 pp. Illustrated. Progressive Age, November 15.

Public Lighting Service, Corporate and Municipal. A study of the cost of electric stations. By Judson H. Boughton. Engineering Magazine, November.

Public Lighting Plant of Detroit, Mich. Paper read by William M. Daly, General Superintendent, before the American Society of Municipal Improvements. 3 pp. Municipal Engineering, November.

Specifications for Street Lighting, as adopted by the National Electric Light Association. 1 p. Midland Municipalities, October.

Overhead Wiring in Columbus, Ohio. By Paul Mason. 6 pp. Illustrated. Insurance Engineering, November.

Methods of Street Lighting, European vs. American. By H. T. Owens. 4 pp. Illustrated. Illuminating Engineer, November.

Buying and Selling Illumination. Paper read before the Empire State Gas and Electric Association by E. Leavenworth Elliott. 2 pp. American Gas Light Journal, November 11.

Gas Institute. President's Address, delivered before the American. By Walton Clark. 1 p. Progress Age, November 1.

New Gas in Germany. By U. S. Consul Samuel H. Shank, Mannheim. 1 p. Daily Consular and Trade Reports, November 23.

Cost, Relative, of Gas Used for Street Lighting. Communication from W. D. Marks. 1 1-2 p. Municipal Engineering, November.

Gas Standards. Paper read before the Empire State Gas and Electric As-

sociation by A. E. Forstall. 1 1-2 p. American Gas Light Journal, November 4. 1 p. Progressive Age, November 1.

Measurement of Electric Light. Communication from L. H. Weissleder. Municipal Engineering, November.

Boston Solved the Gas Problem, How. By Louis D. Brandeis. 5 pp. Review of Reviews, November.

Values of Water Powers, Computations of the, and the Damages Caused by the Diversion of Water Used for Power. By Charles T. Main. 27 p. Journal New England Water Works Association, November.

Damages Caused by the Diverson of Water Power. By Clemens Herschel. 8 pp. Journal of the New England Water Works, September.

FIRE AND POLICE

Police Administration. By Leonhard Felix Fuld. 3 pp. Municipal Journal and Engineer, November 6.

Duties of Police Captains. 1 p. Leonhard Felix Fuld. 1 p. Municipal Journal and Engineer, November 13.

Police Administration. By Leonhard Felix Fuld. 2 pp. Municipal Journal and Engineer, November 20.

Police Captains and Lieutenants. By Leonard Felix Fuld. 1 1-2 pp. Municipal Journal and Engineer, November 27.

Fire Alarm System of Newark. 1 p. Fire and Water Engineering, November 27.

Fire Alarm System of Philadelphia. 2-3 p. Fire and Water Engineering, November 20.

Fire Headquarters in Dublin, New. 1 p. Fire and Water Engineering, November 27.

Fire. Apparatus Transportation by Trolley. 2-3 p. Firemen's Herald, November 9.

Fire Car for the South Side Elevated Railroad. 1 1-2 p. Illustrated. Electric Railway Review, November 9.

Horse and Motor Fire Apparatus. By Frank C. Perkins. 2 1-2 p. Illustrated. Municipal Journal and Engineer, November 20.

Horses, Care of Fire Department. By Chief H. F. Magee, of Dallas, Tex. 2-3 p. Fire and Water Engineering, November 6.

Fire Dangers, Holiday. 4 pp. Insurance Engineering. November.

Dangers from Electric Wires in Fighting Fires, Particularly in Buildings. Paper read before the Massachusetts State Firemen's Association by William Brophy. 3 pp. Firemen's Herald, November 9.

Dangers of Carbon Disulphide in Liquid Form and Best Methods of Storing and Handling It. Paper read before the International Association of Fire Engineers by Chief I. R. Canterbury, of Minneapolis. 1 p. Fire and Water Engineering, November 6. 2 pp. Firemen's Herald, November 16.

Electric Fires, their Cause and Prevention. Address delivered before the International Association of Fire Engineers. 1 p. Fire and Water Engineering, November 6.

Fire Prevention More Important than Fire Extinguishment. Paper read before the International Association of Fire Engineers by H. C. Henly. 1 p. Fire and Water Engineering, October 30.

Legislation for Firemen, Massachusetts. Paper read before the Massachusetts State Firemen's Association by James F. McKissock. 3 1-2 pp. Firemen's Herald, November 23.

High Pressure Systems Under Test. 2 pp. Illustrated. Journal of Fire, November.

GOVERNMENT AND FINANCE

Municipal Ownership in New York State. Paper read before the Empire State Gas and Electric Association by Glen Marston. 1 p. Progressive Age, November 1. 1 p. American Gas Light Journal, November 11.

Syracuse Municipal Ownership Report. 1-2 p. Municipal Journal and Engineer, November 20.

National Civic Federation and Its New Report on Public Ownership. By Prof. Frank Parsons. 7 pp. Arena, October.

Municipal Ownership. Paper read before the American League of Municipalities by H. J. Gouden, with discussion. 10 pp. Bulletin of the League of American Municipalities, November.

Municipal Ownership of Public Utilities. Continuation of paper read before the American Water Works Association by John W. Hill. 3 pp. Water and Gas Review, November. 1-2 p. Fire and Water, November 6.

Good Political Effects of Municipal Ownership. By Prof. Frank Parsons. 2 pp. Pacific Municipalities, September.

Indirect Advantage of Municipal Ownership. 1-3 p. Municipal Journal and Engineer, November 27.

Bureau to Discourage Municipal Ownership. 1-2 p. Western Municipal News, November.

Disinterested Analysis of Municipally Owned Plant. 1 p. Concerning Municipal Ownership. November.

Franchise, Obligations Imposed by the Possession of a. Paper read before the American Gas Institute by Chas. H. Dickey. 2 1-2 pp. American Gas Light Journal, November 18. 2 pp. Progressive Age, November 15.

Public Works Departments, Some Weaknesses in the Organization of Municipal Engineering and. 2-3 p. Engineering News, November 7.

American Cities, What is the Matter with? Extracts from Brand Whitlock's article in November "Circle," with comments. Literary Digest, November 16.

The Issue in Cleveland. The Burton-Johnson Contest for the Mayoralty. 1 1-2 pp. Collier's, November 2.

Government of Toronto. Paper read before the League of American Municipalities by Mayor Coatsworth. 1 1-2 pp. Canadian Municipal Journal, November.

Politics in Municipal Government. Abstract from address of President Morris R. Sherrerd before the American Society of Municipal Improvements. 1 p. Municipal Engineering, November.

London County Council. By Philip E. Pilditch. 12 pp. Empire Review, November.

Municipal Reform in Practice. Experience in London, England. 1 p. Municipal Journal, November 8.

Municipal Employment of Unemployed Women in London. Edith Abbott. 17 pp. Journal of Political Economy, November.

Michigan Constitutional Convention, Propositions Submitted to the. 4 pp. Civic News, November 23.

Wisconsin Public Utilities Law. By Ernest L. Bradford. 1 1-2 pp. Municipal Journal and Engineer, November 6.

Iowa Municipalities, Report of Legislative Committee to the League of. By J. C. Williams, chairman. 3 pp. Midland Municipalities, October.

Saskatchewan, Municipal Commission of. By W. D. Lighthall. 2 pp. Canadian Municipal Journal, November.

Taxation, Low Rates for Public Service vs. Franchise. Paper read before the League of American Municipalities by Allen Ripley Foote, with discussion. 12 pp. Bulletin of the League of American Municipalities, November.

What Method Should Public Utility Corporations Advocate as a Basis for Taxation? Paper read before the Empire State Gas and Electric Association by L. T. Palmer. 1-2 p. Progressive Age, November 1. 2 pp. American Gas Light Journal, November 4.

New Unearned Increment Taxes in Germany. By Robert C. Brooks. 25 pp. Yale Review, November.

Value Received for Taxes. Editorial. 1-2 p. Municipal Journal and Engineer, November 13.

Water Rates, Principles of. Paper read before the Union of Alberta Municipalities by John S. Hall. 2 1-2 pp. Canadian Municipal Journal, November.

Assessment Laws. Paper read before the Union of Alberta Municipalities by John T. Hall. 4 pp. Canadian Municipal Journal, November.

Financing, Municipal. Paper read at the Alberta Municipal Convention by Commissioner Kinnaird. 1 1-2 pp. Western Municipal News, November.

Speculative Ventures, Evils of Municipalities Taking Stock in. Paper read before the Union of Alberta Municipalities by Mayor Cousins. 2 pp. Canadian Municipal Journal, November.

Bond Values, Symposium on. Contributions by Charles E. Sprague, Montgomery Rollins and J. Watts Robinson. 12 pp. Journal of Accountancy, November.

Charts in Accountancy, Use of. By Max Teichmann. 3 pp. Illustrated. Journal of Accountancy, November.

Dock Capital. Expenditure, Receipts and Management. By Lee Galloway. Part II. 10 pp. Journal of Accountancy, November.

REFUSE COLLECTION AND DISPOSAL

Street Cleaning in St. Louis. By James Travilla. 1 1-2 pp. Municipal Journal and Engineer, November 20.

Modern Street Cleaning. 1 p. Contract Journal, November 13.

Cleaning Streets by Flushing. By Frank Aldrich. Abstract of paper read before the American Society of Municipal Improvements. 1 p. Municipal Engineering, November.

Report on Street Cleaning in Boston. Editorial. 1 1-2 p. Charities and Commons, November 2.

Data on Street Cleaning at Washington. 2-3 p. Engineering-Contracting, November 27.

Disposal of Municipal Waste. By W. F. Morse. 4 pp. Illustrated. Municipal Journal and Engineer, November 6.

Garbage Disposal. Paper read before the Central Water Works Association by Thomas R. Cook. 1-2 p. Fire and Water Engineering, November 13.

Municipal Refuse Disposal—An Investigation. Data compiled from studies and personal visits to British refuse disposal plants for guidance in solving problem in Richmond Borough. 46 pp. Illustrated. Proceedings American Society of Civil Engineers, November.

Utilizing City Refuse for Water Works Pumping. By Frank C. Perkins. 1 1-2 pp. Fire and Water Engineering, November 13.

PARKS AND CITY BEAUTY

Care and Maintenance of Parks. Report of Committee on Parks of the American Society of Municipal Improvements. By James Owen, chairman. 7 pp. Illustrated. Municipal Engineering, November.

Preservation of Parks in the United States. 1-2 p. Revista Municipal, November 15.

Tree Maintenance on Boulevards. By Jens Jensen. 1 p. Municipal Journal and Engineer, November 13.

Landscape Art, German, Seen in Park Plans. 2 pp. Illustrated. Park and Cemetery, November.

Parks, Toronto Public. 1 p. Illustrated. Municipal World, November.

West Side Parks, Chicago. 1 1-2 pp. Illustrated. Gardening, November 1.

Bridges of Concrete, Cleveland is Building all Her Park. 2 pp. Illustrated. Concrete, November.

School Gardens for Consumptive Children. From article by Louis Riviere in Correspondant. 1-2 p. Australian Review of Reviews, October.

TRAFFIC AND TRANSPORTATION

Track Construction in Some Southern Cities. 2 pp. Illustrated. Street Railway Journal, November 23.

Some Recent Street Railway Track Construction. 1 1-3 pp. Illustrated. Engineering News, November 7.

Use of the Trail in Cities. Paper read before the convention of the American Street and Interurban Railway Association by C. Gordon Reel. 2-3 p. Illustrated. Engineering Record, November 9.

Boston Elevated Station Changes. 1 p. Illustrated. Electric Railway Review, November 2.

Trolley Express Activity in Vicinity of Boston. 1-2 p. Street Railway Journal, November 2.

New York's Terminal Problem. By Walter Reece Evans. 10 pp. Illustrated. Moody's Magazine, November.

Livingstone Street Railway Improvement for Relieving Brooklyn Rush-hour Traffic. 2 1-2 pp. Illustrated. Street Railway Journal, November 16.

Cleveland, Report of Expert Accountants on the Municipal Traction Company of. 1 1-2 pp. Electric Railway Review, November 9.

Shanghai Tramways. 1 p. Illustrated. Far Eastern Review, September.

Automobile Truck for the Connecticut Company. 1 p. Illustrated. Electric Railway Review, November 16.

Subways Noiseless, to Make. Abstract of paper in La Nature by R. Bonnin. 1 p. Illustrated. Literary Digest, November 9.

Organization, Municipal Tramways Staff. By James Dalrymple. 2 1-2 pp. Surveyor, November 1, 8.

Control from the Corporate Standpoint. Paper read before the Street Railway Association of New York by Everett W. Burdett. 3 pp. Public Service, November.

Situation of To-day, Electric Railway. Paper read before the Street Railway Association of New York by Henry J. Pierce. 2 pp. Public Service, November.

Municipal Ownership, Report of the Committee of the American Street and Interurban Railway Association on. 2 pp. Electrical Review, November 2.

Tramways Association of Great Britain, Convention of the Municipal. 1 1-2 pp. Street Railway Journal, November 2.

MISCELLANEOUS

Description of Cities.

Stamford, Connecticut, 1 1-2 pp. Illustrated. Municipal Journal and Engineer, November 27.

Gary, Indiana. 2 pp. Illustrated. Real Estate News, November.

Los Angeles as the Paris of America. By William R. Stewart. 3 pp. Travel, November.

Rio de Janeiro Improvements. 4 pp. Daily Consular and Trade Reports, October 31.

San Pedro Harbor. By Amos A. Fries. 31 pp. Out West, October.

Municipal Works at Teighmouth. By Charles F. Gettings. 7 pp. Illustrated. Contract Journal, October 23. 7 pp. Illustrated. Surveyor, October 25.

Municipal Paris. 1 p. Revista Municipal, November 15.

Modern European City—Nuremberg. By Consul H. W. Harris. 2 pp. Daily Consular and Trade Reports, November 22.

Udnum, the Oldest City in the World. 1-2 p. Leslie's Weekly, November 21.

News from Connecticut Towns. 3-4 p. Municipal Journal and Engineer, November 20.

Town Planning, Sweden and. A translation of the Swedish law. 1-2 p. Municipal Journal, November 8.

Public Convenience Stations of Washington, D. C. By Ernest S. Bradford. 3 pp. Illustrated. Municipal Journal and Engineer, November 13.

Libraries, Municipal Reference. 1-2 p. Municipal Journal and Engineer, November 13.

Markets in Cleveland, Municipal. 1-3 p. Municipal Journal and Engineer, November 27.

Public Works Recently Carried Out at Hampton-on-Thames. Conclusion of paper read before the Municipal and County Engineers by S. H. Chambers. 11 pp. Illustrated. Surveyor, November 8.

Proposed Dock System of Newark. 1 p. Illustrated. Engineering Record, November 16.

Baron Haussman and the Topographical Transformation of Paris under Napoleon III. Part III. 17 pp. Illustrated. Architectural Record, November.

Bridge at Catskill, N. Y., Six-Span Highway. 2-3 p. Illustrated. Engineering Record, November 16.

Design for the Henry Hudson Memorial Bridge, a concrete rib arch of 703-foot span. 2 1-2 pp. Illustrated. Engineering News, November 21. 2-3 p. Illustrated. Engineering Record, November 16. 1-2 p. Engineering Record, November 23.

Manhattan Approach of the Blackwell's Island Bridge. 3 1-2 pp. Illustrated. Engineering Record, November 23.

Simple Highway Bridge. 1-3 p. Illustrated. Engineering Record, November 23.

Two Unique Electrically Operated Australian Swing-Bridges. 2 pp. Illustrated. Electrical Review, November 23.

Municipal Progress in the United States. 1-2 p. Revista Municipal, November 15.

Municipal Matters in Great Britain and America and on the Continent. By W. Calder. 2 1-2 pp. Surveyor, October 25.

Advertising. Municipal Restrictions and Grants in Hamburg. By Deputy Consul General O. W. Hellmrich. 4 pp. Daily Consular and Trade Reports, November 21.

Housing Progress. Official Monthly Record of the National Housing Reform Council. 1 1-2 pp. Municipal Journal, November 8.

Cost of Living in New York. By Lee H. Frankel. 6 pp. Charities and Commons, November 16.

Investigations by Non-Experts. 1-2 p. Municipal Journal and Engineer, November 27.

Chicago Public Land Investigation. 1-2 p. Real Estate News, November.

How San Francisco Spent the Relief Fund. By Winnifred Mears. 8 pp. Illustrated. World To-day, November.

Two Writers on San Francisco. Abstracts from articles in American Magazine by Lincoln Steffens and in McClure's by George Kennan. 6 pp. Pacific Municipalities, October.

Moate and the Beam. A fact novel. II—Breaking Into San Francisco. By Lincoln Steffens. 10 pp. Illustrated. American Magazine, December.

Great American Fortunes and Their Making. Street Railway Franchises—II. By Burton J. Hendrick. 14 pp. McClure's, November.

Complaints, Facilitating. Editorial. 1-2 p. Municipal Journal and Engineer, November 6.

Public Service Charges. Are They Too Low? By Frederic Rice, Jr. 2 pp. Moody's Magazine, November.

Competitive Bidding, Evil Effects of. By George C. Nimmons. 2 pp. Construction News, November 2.

Extra Work, What Constitutes. Contractor's Right to Compensation Therefor. By John Edson Brady. 1-2 p. Architects and Builders' Journal, November.

Costs Instead of Contract Prices, Should Every Engineer Know Actual? Editorial. 2-3 p. Engineering-Contracting, November 20.

Rust Prevention. Part I of abstract of treatise by L. M. Stern. 4 pp. Iron Age, November 21.

Sheet Piling and Earth Pressure. 2-3 p. Engineering Record, November 16.

Reinforced Concrete, Philadelphia Regulations in Regard to the Use of. 2 pp. Illustrated. Engineering News, November 14. 4 pp. Cement Age, November.

Building Code of Cleveland, Ohio, for Concrete Construction. 1 1-2 pp. Concrete, November.

Ferro-Concrete and Its Application to Engineering Construction. Paper read before the Civil and Mechanical Engineers' Society by J. S. E. De Vesian. 3 pp. Contract Journal, November 13.

Municipal Board, Ontario Railway and. 1-2 p. Municipal World, November.

Superannuation. Experience in Birmingham, England. 1 p. Municipal Journal, November 8.

Societies.

American Society of Municipal Improvements. Editorial. 1 p. Municipal Engineering, November.

Detroit Convention of the American Society of Municipal Improvements. Report of Proceedings. 4 pp. Illustrated. Municipal Engineering, November.

Annual Convention of the National Municipal League and the American Civic Association. 1 1-3 pp. Engineering News, November 28.

Tenth Annual Convention of the League of Iowa Municipalities. 11 pp. Midland Municipalities, October. 1 1-2 pp. Revista Municipal, November 1, 18.

NEWS OF THE SOCIETIES

Utah Mayors' Association.—The Mayors' Municipal Convention was held at Nephi, November 21, with E. W. Robinson, President of the Municipal League, in the chair. T. R. Foote, of Nephi, acted as Secretary. The roll-call showed about fifty delegates from the different cities of the State, mostly Mayors. Mayor Pettigrew, of Nephi, delivered the address of welcome. Mayor Robinson, of Logan, in delivering his annual address spoke of the many benefits to be derived from these meetings; told why Utah was so backward in municipal improvements, which was owing to the fact that the streets were so wide and the blocks so long, and in many cases so sparsely settled that the expense in improvements was so great that progress was made slowly, and incidentally took a fall out of the "knockers" who were forever finding fault with everything done or undone. One of the most important papers read was one on municipal engineering, by City Engineer Parker, of Ogden. In the evening a spirited discussion on prohibition vs. high license was held in the tabernacle before a crowded house. Mayor Hall, of Springville, led the discussion for the prohibitionists. Mayor Munson, of Mount Pleasant, favored high license. Mayor Pettigrew was noncommittal, simply favoring a strict enforcement of the law. At the second day's session the morning's program included a paper by Dr. Clift, of Provo, on "The Effect of Sanitation on Mortality." The afternoon session opened with a general discussion of the question of municipal ownership of electric lights. The preponderance of opinion favored municipal ownership, Nephi being cited as a notable example of successful operation. Election of officers followed: Mayor E. W. Robinson, Logan, re-elected President; First Vice-President, Mayor Frisby, of Provo; Second Vice-President, A. L. Clark, of Farmington; Third Vice-President, J. A. Hyde, Mayor-elect of Nephi; Secretary-Treasurer, David Johnson, of Provo. The next meeting will be held at Provo.

League of California Municipalities.—At the annual convention held at Pasadena, November 12-15, the following officers were elected: President, J. J. Hanford, Mayor of San Bernardino; First Vice-President, Councilman W. L. Pieper, of San Jose; Second Vice-President, A. E. Orr, of Visalia; Secretary, H. A. Mason, of Mountain View. The city of Sacramento was chosen for the next annual meeting place. State Controller A. B. Nye, in an interesting paper on "Municipal Accounting and Statistics," argued that there should be some method of collecting and publishing the statistics of the 172 incorporated cities and towns in the State, as well as of more than 3,000 school, sanitary, irrigation, reclamation and other districts. Nobody, the speaker said, knows the aggregate of the debts or the taxes annually levied. In closing, Mr. Nye expressed a desire to work with the League in evolving a plan for gathering, arranging and printing the data concerning municipalities and taxing districts.

City Contract Enforcement League.—This is the title of the new municipal organization of business men formed at Philadelphia, Pa., to see that contractors perform their work properly. Major Cassius M. Gillette, together with John Trautwine, Jr., George Wentworth Carr, D. Wendell Hurlburd and Clarence L. Harper, were named as a committee to report on a constitution, which is now ready. This provides, among other things, that none of its members are to be allowed to mix up in politics and in order that it shall not be used as a stepping stone to acquire public office, any member contemplating going in for politics must give the league six months' notice of such intent, so that he may be dropped. The purpose is to do just what the title implies. The following explanation regarding the formation of the league has been given by Major Gillette: "The movement originated in the home of Rudolph Blankenburg, and there were present in addition to Mr. Blankenburg, Charles Emory Smith, Francis B. Reeves, John H. Converse, E. A. Van Valkenburg, ex-Judge James Gay Gordon, Cyrus D. Foss, Jr., and myself. Later we met at the home of Mr. Smith, who prepared a letter to be addressed to public-spirited men, and later we had a meeting at the City Club, at which S. Emlin Meigs presided, and Clarence L. Harper was secretary. That meeting named the committee to complete the organization and that report is now ready. The plan is to have a membership of at least 50 to start with, and those shall name the executive committee of fifteen to conduct the work of the league."

North Dakota Municipal League.—At the convention held at Grand Forks, November 18, the subject of legislation occupied the chief attention. Plans to secure needed legislation for cities were discussed and rough drafts of two bills which are to be introduced at the next session of the Legislature were considered. One of the bills is designed to give cities themselves power to construct improvements, in case all bids for the work are rejected, and provides for the assessment against the property benefited. The other bill relates to the approval of plats or real estate additions by city councils. The social feature of the convention was a reception and musical entertainment in the Commercial Club rooms.

Canadian Clay Products Manufacturers.—The Sixth Annual Convention, held in Ottawa, Ontario, November 19-21, was called to order by President Millar. Mayor J. F. Scott welcomed the visitors and extended the freedom of the city to them. The Minister of Railroads and Canals, Hon. George P. Graham, also delivered a welcoming address. In the evening a banquet was given in the Russell House. The following officers were elected for the coming year; President, J. S. McConnell, Milton, Ont.; Vice-Presidents, Henry Jones, Delaware, Ont.; James Cornhill, Chatham, Ont.; S. M. Mulligan, Toronto, Ont.; Secretary-Treasurer, D. O. McKinnon, Toronto, Ont.

National Civic Federation.—The annual meeting will occur December 16-17, in the assembly room of the Park Avenue Hotel, New York City. The subjects to be discussed are: Currency Reform; Postal Savings Banks; Wage Earners' Insurance: Is the Reduction of Wages in Time of Depression Justifiable or Necessary? Reports will be made on the work of the public ownership commission, the conciliation and immigration departments; on the investigation of the conditions surrounding the employes of the government at Panama,—under the welfare department, and from the industrial economics department on the results of the recent conference on combinations and trusts held under its auspices in Chicago, and on the organization and proposed plan of work on the joint child labor committee.

New England Water Works Association.—The December meeting will be held at Hotel Brunswick, Copley Square, Boston, Mass., on Wednesday, December 11. The programme is as follows: 10 o'clock, the headquarters in Tremont Temple will be open for the use of members; 11:30 o'clock, meeting of the Executive Committee at the Headquarters, Tremont Temple; 1 o'clock, lunch will be served at Hotel Brunswick, Copley Square; tickets, $1.75, to be had at headquarters during the morning and later at the hotel. 2 o'clock, the following papers will be presented: "A Few Words About Hollow Concrete-Steel Dams," by Mr. Charles H. Eglee, hydraulic engineer, Boston; "Gloucester, Mass., Illustrated," by Mr. H. W. Spooner, Superintendent Water Works, Gloucester, Mass.; Topical Discussion.

Calendar of Meetings

December 3-6.
American Society of Mechanical Engineers.—Fifty-fourth annual meeting at New York City.—Calvin W. Rice, 29 West Thirty-ninth street, New York City, Secretary.

December 4-6.
National Association of Manufacturers of Sand Lime Products.—Convention, Chittenden Hotel, Columbus, O.—Harry de Joannis, Secretary, 45 Plymouth Court, Chicago, Ill.

December 5-7.
Society for the Promotion of Industrial Education.—Convention, Chicago, Ill.—C. R. Richards, Secretary, Columbia University, New York City.

December 11.
New England Water Works Association.—December meeting, Hotel Brunswick, Boston, Mass.—Willard Kent, Secretary, 715 Tremont Temple, Boston, Mass.

December 13.
American Institute of Electrical Engineers.—223rd Meeting, Auditorium, Engineers' Building, 33 West Thirty-ninth street, New York City.—R. W. Pope, Secretary.

December 16-17.
National Civic Federation.—Annual meeting, Assembly Room, Park Avenue Hotel, New York City.—Edward A. Moffett, Secretary, 281 Fourth avenue, New York City.

December 17-21.
Cement Products Exhibition Company.—First annual cement show, Coliseum, Chicago, Ill.—L. L. Fest, Manager, Michigan avenue and 13th street, Chicago, Ill.

December 18.
American Society of Civil Engineers.—Semi-monthly meeting at the House of the Society.—Charles Warren Hunt, Secretary, 220 West Fifty-seventh street, New York City.

December 26.
International Sanitary Convention of American Republics.—Third international meeting, Mexico City.—Surgeon General Walter Wyman, Chairman International Sanitary Bureau, Public Health and Marine Hospital Service, Washington, D. C.

January 14-16.
Illinois Clay Workers' Association.—Thirtieth annual convention, Peoria, Ill.

January 20-25.
National Association of Cement Users.—Fourth annual convention at Buffalo, N. Y.—W. W. Curtis, 585 Caxton Bldg., Chicago, Secretary; Dai H. Lewis, 760 Main street, Buffalo, N. Y., Convention Manager.

January 22-23.
Iowa Brick and Tile Association.—Twenty-seventh annual convention, Des Moines, Iowa.—C. B. Platt, Secretary, Van Meter, Iowa.

February 3-4.
American Ceramic Society.—Twenty-second national convention, Hartman Hotel, Columbus, O.—Theo. A. Randall, Secretary, Indianapolis, Ind.

February 3-4.
National Paving Brick Manufacturers' Association.—Southern Hotel, Columbus, O.—Theo. A. Randall, Secretary, Indianapolis, Ind.

March.
Municipal Art Society of New York.—Seventh annual exhibition at the Galleries of the National Arts Club, Gramercy Park, New York City.—William Walton Secretary, 119 East 19th street, New York City.

PERSONALS

BALDWIN, SAMUEL W., President of the Connecticut National Bank, and Charles G. Sanford, President of the First National Bank, have been appointed by Mayor Lee, of Bridgeport, Conn., to succeed themselves on the Board of Sinking Fund Commissioners when their terms expire January 1; associated with them on the board are David F. Read and De Ver H. Warner.

BILLOTT, C. C., was recently elected County Surveyor of Prince George County, Md.

CASEY, JOHN, Chief of the Fire Department of Muncie, Ind., who was deposed a year ago, has been reinstated by Mayor Guthrie after a mass meeting and a petition signed by almost a thousand citizens had been presented to Council asking the impeachment of the Mayor; three chiefs served without success during Chief Casey's interval of retirement.

GILDERMAN, HENRY, Duluth, Minn., has been elected Chief of the Fire Department, vice Joseph Brand, resigned.

GOODWIN, R. E., and A. J. MESTER, Springfield, Ill., Superintendent of Streets and Superintendent of the Health Department of the city, respectively, recently visited Joliet and Chicago, Ill., and other cities on a tour of inspection, and inquired especially into the manner of keeping the streets clean and contagious diseases and their prevention, as the State Capital has had over sixty cases of smallpox.

HANDY, EDWARD A., M. Am. Soc. C. E., General Manager of the Lake Shore & Michigan Southern Ry., died on November 21 at Chicago. Mr. Handy was born at Barnstable, Mass., in 1855; he entered the railway field immediately after graduation from the Massachusetts Institute of Technology, and in 1888 was appointed Chief Engineer of the Lake Shore & Michigan Southern Ry., and later General Manager. He was also General Manager of the Lake Erie & Western R. R.

LINDSLEY, JOHN N., Orange, N. J., has been selected President of the Police Commission, and John A. Dugan, Secretary. The Commissioners for the Police Department are: John B. Everett, for four years; John N. Lindsley, for three years; Henry Berg, for two years, and Manton B. Metcalf, for one year.

MCCABE, CHARLES J., Chief of Police, Poughkeepsie, N. Y., was married November 20 to Miss Elizabeth Sullivan, formerly of Poughkeepsie, but recently residing in New York City. Chief McCabe and his bride visited Washington, D. C., on their wedding trip.

MAGOWAN, CHARLES S., Professor of Municipal and Sanitary Engineering in the College of Applied Science, State University of Iowa, died recently after an illness of some months duration. Prof. Magowan had been a member of the faculty of the University of Iowa for twenty-one years.

MARTIN, GEORGE A., of Orange, N. J., has been selected to head the Fire Commission. The two Fire Commissioners are Thomas F. Brennan, for four years, and Sumter L. Beegle, for one year. Their Republican colleagues were confirmed several months ago. They are Dr. Robert S. Watson, for three years, and George A. Martin, two years.

PIPER, E. E. E., has been elected County Surveyor of Washington County, Md.

TAYLOR, PERCY B., of Newark, N. J., has been requested by the Special Grade Crossing Committee of Council to go to Wilkes-Barre, Pa., and look over the plans submitted for the elimination of grade crossings and the ground as well.

TRADE NOTES

Change of Address.—The J. H. Strain Co., manufacturers of road machinery, who have been located for the past few years at 10-12 Elm street, New York City, have removed to 85-87 Front street.

Distilled Water.—The Pure Water Company, Philadelphia, Pa., has offered to supply distilled water to the consumers of Grand Rapids at the rate of one cent per gallon. The company states that its apparatus will produce pure water for from 15 cents to 50 cents per 1,000 gallons. A duplicate system of pipes is advocated, a single faucet for each home being all that is necessary on the pure water line.

Electrical Centrifugal Pump.—The General Electric Company, Schenectady, N. Y., has installed and tested an electrical centrifugal pump for the city of Duluth, Minn. The rated capacity of the pump is 12,000,000 gallons of water every twenty-four hours. At the test it handled 13,250,000 gallons, apparently without crowding. A Venturi meter was used for determining the flow, but an ordinary large water meter will be installed. A small building will be erected over the pump before it is put in regular commission.

Electric Hoist.—The Interstate Equipment and Engineering Co., Old Colony Building, Chicago, Ill., has placed on the market an electric material hoist for contractors. This machine is designed so that the hoist cannot burn out, whatever the condition of loading. Besides, the machinery is well cased in as a protection from water and dirt.

Excavating Machine.—W. E. Short, of Quincy, Ill., has invented a new excavating machine suitable for building levees or ditches, and one is in actual operation at Quincy. Earth is excavated by a large wheel provided with thin arms, situated at the rear end of the machine. Two of these arms are supplied with shears cutting alternately with each other. The third arm has a wrist which drives the shovel beam, taking the loose earth out of the ditch and placing it on the embankment. The wheel revolves from six to ten times per minute, hauling from fifty to one hundred loads of earth over the side of the embankment, thereby consolidating it. The machine is moved about by means of a cable and drum.

Flaming Arcs.—The Haverhill Electric Light Company, Haverhill, Mass., recently placed on exhibition four electric arc lights, which were recently inspected by the Committee on Street Lighting of the City Council. The lights are series alternating flaming arc lamps and are among the first built by the General Electric Company. If Haverhill adopts them it will be the first city to be so equipped.

Gamewell Fire Alarm.—The workings of the new Gamewell Fire Alarm System, recently installed in the City Hall, Newark, N. J., were recently explained and tested by Harry Reed of the Gamewell Company, in the presence of a party of city officials. An alarm box had been set up in the room and on the opposite side a gong was placed to represent a similar one in a fire house. When the box was pulled it was shown how the signal was received at the relay and "joker" boards and thence sent out by the transmitter. After the test Colonel Joseph W. Stover, president of the company, notified the city that the plant was ready for acceptance.

Hydrant Adaptor.—The British Fire Prevention Committee, in Red Book No. 123, gives an account of fire tests made with a hydrant fitted with an "adaptor," an automatic device for putting the hydrant in operation as the hose is carried to the scene of action. The "adaptor" was submitted for test by Messrs. W. Featherstone & Co., Rochester, England. The conclusion reached was that for public buildings, warehouses, hospitals, hotels and the like, where employees are, in an emergency, called upon to handle the fire appliances, the adaptor has considerable advantage over the screw-down wheel valve ordinarily attached to a hydrant.

Testing Laboratories.—The Meade Testing Laboratories, Young Bros.' Building, Nazareth, Pa., have been established for the inspection and testing of cement. The equipment is of most approved form, designed to carry out the stndard tests of the American Society of Civil Engineers, as well as special tests. Richard K. Meade is Director of the laboratory and Clarence E. Kline is Engineer of Tests.

PATENT CLAIMS

870,930. Dam. William L. Church, Newton, Mass. Serial No. 382,105.

In combination, a substantially vertical penstock, and means for preventing the admission of water-displacing bodies of air with the water entering the penstock.

870,934. Dam. Howard L. Coburn, Boston, Mass. Serial No. 270,369.

A dam comprising an impervious deck slab rising from suitable foundations and inclined in the direction of flow of stream, an oppositely inclined slab or apron meeting the deck to form the crest of the dam, the said apron being of a strength and standing at an angle to prevent the overturning of the deck by the weight of water resting thereon, said deck and apron forming an unobstructed interior.

871,085. Gate Valve. Charles A. Claflin, Medford, Mass. Serial No. 351,501.

A gate valve comprising a casing having a valve chamber, and openings at opposite ends of the chamber, said openings being enlarged at their outer portions to form shoulders, seat sleeves detachably inserted in said openings, and having flanges bearing on said shoulders, the inner ends of said sleeves constituting beveled or inclined valve seats which project into the valve chamber, means for detachably securing the seat sleeves to the casing, means for positively locking said sleeves against being turned in said openings, and a disk carrier movable between said seats, and provided with valve disks adapted to engage the seats.

871,185. Deep Well Pump. George C. Richards, Berkeley, Cal., assignor to The Western Mill & Machine Co., a Corporation of California. Serial No. 326,680.

In a pump, the combination of a barrel and a plunger therein, said plunger comprising a tubular section, a valve cage connected with the lower end of the section, an annular shoe below the cage, said shoe having an upper end abutting the end of the cage and having its remaining portion forming a vertical prolongation of said cage, a threaded interior sleeve union connecting the said lower shoe and cage, an annular shoe above the upper end of said section, a separate threaded interior sleeve union connecting said last-named shoe with said section, and a sucker-rod connected with the last-named sleeve union.

871,212. Street Sweeper. Wilfred Dupre, Worcester, Mass., assignor of forty-eight fiftieths to Hugh H. O'Rourke, Worcester, Mass. Serial No. 197,683.

The combination with a sweeping device, of an inclined endless conveyor, a plate pivoted at a point above the lower end of the conveyor and depending from its pivots, and yielding means for forcing the lower edge of the plate into engagement with the lower end of the conveyor.

871,389. Drain Pipe. Edwin J. Cochran, Sterling, Ill. Serial No. 391,829.

A device of the class named, comprising a plurality of pipe sections, provided at alternate ends with annular rims; a pair of longitudinal grooves on the inner side walls of said sections; and a pair of longitudinal flanges on the outer walls of said sections, spaced apart therefrom, and adjacent to said grooves on the inner walls of the sections, substantially as described.

871,427. Controlling Device for Deep Seal Siphons. Sidney W. Miller, Chicago, Ill. Serial No. 337,961.

An auxiliary or blow-off trap for siphons adapted to extend at one end into the siphon, the outlet end of the trap being adapted to move endwise relatively to the siphon and to the inlet end of the trap for the purpose of varying the depth of seal of said trap.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Buildings, Bridges and Street Railways—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we can not guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Street Improvements				
Indiana	Danville	December 5, 10 A.M.	Constructing 1¼ miles gravel road, Marion township	David D. Mills, Co. Auditor.
Tennessee	Memphis	December 5, noon	Paving, gravel, La Clede Ave., La Rose Place, to Lauderdale St.	James H. Malone, Mayor.
Ohio	Toledo	December 5	Laying and repairi'g all delinquent walks and driveways for year.	Reynold Voit, Sec'y Bd. Pub. Serv.
Iowa	Cedar Rapids	December 5	Constructing pavements on certain streets	W. C. Byers, Chm. Pub. Imp. Com.
Indiana	Peru	December 7, noon	Grading, draining, paving, etc., 23½ miles gravel roads	Charles Griswold, Co. Auditor.
Colorado	Jamestown	December 7, noon	Building and repairing 1½ miles County wagon road	T. W. Jaycox, Denver, State Eng.
New Jersey	Camden	December 9, 11 A.M.	Constructing gravel road 2.33 miles, Berlin to Tansboro	J. J. Albertson, Co. Engr.
Indiana	Lebanon	December 10, 1 P.M.	Constructing gravel road between Boone and Hamilton Counties.	B. F. Simmons, County Auditor.
New Jersey	Salem	December 10, 8 P.M.	Grading and placing oyster shells 1.58 miles of road	John F. Ayars, Dir. Freeholders.
Missouri	St. Louis	December 10	Paving numerous alleys with vitrified paving brick	A. J. O'Reilly, Pres. Bd. Pub. Imp.
Ohio	Ashtabula	December 10	Paving certain streets with brick on concrete foundation	A. J. Richardson, City Clerk.
New York	Brooklyn	December 11, 11 A.M.	Regulating and repaving various streets	Bird S. Coler, Boro. President.
New York	Ft. H. G. Wright	Dec. 11, 11:30 A.M.	Constructing macadam roads, sidewalks and grading	Capt. Wm. E. Horton, Q. M.
Ohio	Columbus	December 11	Paving 13 streets and avenues	E. F. McGuire, Sec'y Bd. Pub. Serv.
Pennsylvania	Harrisburg	December 11	Bldg. 2 roads, 2,700 and 6,932 ft. long, Cumberland County	Jos. W. Hunter, St. H'g'way Com'r.
New Jersey	Flemington	December 12, 10 A.M.	Macadamizing 34,200 lin. ft. road	Grant Davis, County Engineer.
Indiana	Anderson	December 12, 2 P.M.	Constructing 9,140 ft. gravel road	James Kinnard, County Auditor
Pennsylvania	Harrisburg	December 13	Bldg. 3 roads, 600 ft., 5,730 and 1,520 ft. long, Cumberland Co.	Jos. W. Hunter, St. H'way Com'r.
Ohio	Norwood	December 14, noon	Grading and macadam r'dways; curb, gutter, etc., various sts.	Board of Public Service.
Indiana	Lebanon	December 14, 1 P.M.	Constructing gravel road Co. line, bet. Boone and Hamilton Cos.	Boone County Commissioners.
Ohio	Steubenville	December 16	Paving Market Street	T. W. Vance, Clk. Bd. Pub. Ser.
New York	Buffalo	December 16	Paving portions of 3 streets; repaving 2 streets	F. G. Ward, Com'r Public Works.
Pennsylvania	Philadelphia	December 17, noon.	Paving railway yards in connection with grade crossing work	W. Hunter, Ch. Eng'r P. & R. Ry.
Louisiana	Providence	December 17, noon	Paving and curbing four miles of sidewalks	T. J. Powell, Mayor.
Ohio	Cleveland	December 18	Building Standard guard railing on Brecksville road	A. B. Lea, County Surveyor.
Pennsylvania	Washington	December 20, noon	Repairing improved roads	Wm. Wylie, County Engineer.
Connecticut	Ridgefield	January 2, 2 P.M.	Grading and graveling section of road	Geo. H. Whitlock, First Selectman.
Tennessee	Fayetteville	January 2	Constructing concrete pavements	W. G. Kirkpatrick, Jackson, Miss., Civil Engineer.
Utah	Salt Lake City	January 3, 8 P.M.	Grading, paving and curbing First South St., inc. 60,000 cu. yds. grading, 17,000 lin. ft. curb, 41,000 sq. yds. asphalt	Louis C. Kelsey, City Engineer.
Montana	Billings	February 4, 5 P.M.	Constructing 86,653 sq. yds. gravel macadam; 3,000 lin. ft. sewer, complete, etc., 17,400 lin. ft. gutter, complete	J. D. Matheson, City Clerk.
Montana	Billings	February 4, 8 P.M.	Constructing 6,305 sq. yds. shale brick pavement	J. D. Matheson, City Clerk.
Water Supply				
Illinois	Chicago	December 7, 11 A.M.	Furnishing 5,300 tons 6 to 12-in. c. i. water pipe	John J. Hanberg, Com'r Pub. Works
Iowa	Atlantic	December 7, 7:30 P.M.	Drilling two 8- or 10-in. wells, 50 ft. or deeper; casing valves and fittings, 8- or 10-in. c. i. pipe connections to main; 1,000 ⅝ to 2-in. meters; 700,000 gal. high duty engine, to lift from 26 ft. against head of 90 to 160 lbs., triplex or power pump, etc	T. E. Nichols, City Clerk.
Alabama	Bay Minette	December 9, noon	Constructing water works, closets, etc., Co. Court House	J. H. H. Smith, Judge of Probate.
New York	New York	December 11, 2 P.M.	Furn. and erecting system of water curtains, etc., ready for operation at two high-pressure pumping stations	John H. O'Brien, Com. W. S., G. & E.
Pennsylvania	Cambridge Sp'gs.	Dec. 12, 7:30 P.M.	Constructing mechanical filter plant	J. F. Himebaugh, Burgess.
North Dakota	Grand Forks	December 15	Extending water mains on several streets	W. V. O'Connor, City Auditor.
New Jersey	Camden	December 17, 8 P.M.	Improving present artesian water supply system and adding to 17,000,000-gal. supply at least 5,000,000-gals. daily	Jas. Potter, Chm. Water Com.
Florida	Fort Dade	December 19, 8 P.M.	Constructing three cypress cisterns at post	Constructing Quartermaster.
Maine	Norway	December 31	Constructing 1,000,000 gal. reservoir	S. D. Andrews, Pres. Water Co.
Arizona	Tucson	January 8, 8 P.M.	Furnishing material and constructing water works system	Frank S. Treat, City Clerk.
Nebraska	Wood River	January 15	Constructing water works and electric light plant; cost, $17,000.	D. D. O'Kane, Village Clerk.
Manitoba	Winnipeg	January 15	Furnishing 15 miles of assorted water pipe	H. N. Ruttan, City Engineer.
Illinois	Aurora	January 17	New air compressor for pumping station	M. J. Tarble, City Engineer.
Sewerage				
Iowa	Des Moines	December 4, 11 A.M.	Constructing 968 ft. 12-in. vit. pipe sewer, etc	W. W. Wise, Bd. Pub. Wks.
Ohio	Dayton	December 4	Constructing sanitary sewers Dist. No. 3, inc. 70,050 ft. 6-15-in. vit. pipe; 68,250 ft. trench and backfill, 6 to 28 ft. deep; 80 lamp holes, etc.; repaving 1,500 sq. yds. brick; 100 asphalt; 6,000 lin. ft. boulder, etc	Robert Kline, City Engineer.
Minnesota	St. Paul	December 5, 2 P.M.	Building sewer in Erie St. from Seventh to Grace Streets	R. L. Gorman, Clk. Bd. Pub. Wks.
Pennsylvania	McKeesport	December 5, 4 P.M.	Constructing 15-in. t. c. sewer in Jim Crow alley, etc	C. E. Soles, City Controller.
Michigan	Flint	December 6	Constructing sewer in Lapeer Street	M. Middleton, City Engineer.
Ohio	Zanesville	December 6	Labor and material for constructing sewers, 6 streets	P. J. Kerwin, Sec'y Bd. Pub. Serv.
Georgia	Forsyth	December 6	Constructing $15,000 sewerage system	H. F. Wilder, City Clerk.
New York	Marcy	December 7, 7 P.M.	Constructing 1,500 ft vit. pipe sewer in Stittville Village	W. G. Stone, Mann Bldg., Utica, C.E.
Indiana	Evansville	December 7	Constructing pipe sewers in 7th and 4th Avenues, and in alley	W. F. Wunderlich, Clk. Bd. Pub. W's
Ohio	Toledo	December 9, noon	Constructing local sewers Nos. 1011 and 1014	Reynold Voit, Sec'y Bd. Pub. Serv.
Ohio	Orrville	December 9, noon	Constructing $70,000 sewer system and disposal plant, inc. 75,000 ft. 8 to 15-in. pipe, 60 manholes, etc	S. W. Jackson, Village Clerk.
Ohio	Steubenville	December 9, noon	Constructing sewer in Market St. from Liberty	T. W. Vance, Clk. Bd. Pub. Service.
Nevada	Reno	December 9	Excavating and backfilling for laying south side sewer system	H. B. Maxon, City Engineer.
Ohio	Lorain	December 9	Constructing brick storm sewer in Penfield Ave	C. M. Damon, Clerk Pro. Tem.
New York	Brooklyn	December 11, 11 A.M.	Constructing a sewer and sewer basins in various streets	Bird S. Coler, Boro President.
Ohio	Wapakoneta	December 13	Constructing branch sewers in Ohio and W. Benton Streets	Chas. Fisher, Village Clerk.
Ohio	Norwood	December 14	Constructing sanitary sewer in portion of Sherman Ave	Jas. A. Stewart, Cincinnati, C. E.
Kentucky	Louisville	December 17, noon.	Construction Sec. B. outfall sewer; 3,322 ft., 15′2″ x 15′ 6″; 1,820 ft., 14′ 5″ x 15′; 970 ft., 13′ 11″ x 14′ 3″, inc. 6,143 lin. ft., exc. 22 to 42 ft. deep; 17,000 cu. yds. concrete; 1,200,000 lbs. rein. steel bars; 21,000 bbls. Portland cement, etc	J. B. F. Breed, Chief Engineer.
Ohio	Springfield	December 18, noon	Bldg. portion high level intercepting sewer in 6 sts., inc. 9,816 ft. 24-33-in. pipe, plain or rein. concrete; 9,376 ft. 6-in. pipe, average depth, 10 ft.; 800 ft. 8-in. sanitary sewer; Y's, manholes, etc., 115 cu. yds. concrete; 17,875 cu. yds. rock excavation	W. H. Sieverling, City Engineer.
North Dakota	Towner	December 18	Extending sewer system	Frank Neikirk, City Auditor.
Iowa	Wapello	December 19	Constructing Van Buren St sewer; cost, $6,000	W. S. Kremer, Civil Eng'r.
California	Santa Monica	December 21	Constructing septic tank, also pier 1,600 ft. long, to carry outfall pipe from tank to ocean; also plans, etc	Thomas H James, City Engineer.
Utah	Salt Lake City	January 3, 8 P.M.	Pipe sewers in Extension No. 101	L. C. Kelsey, City Engineer.
Philippine Isds.	Manila	January 19, noon	Twelve pumps and motors for new sewer system	J. F. Case, Chief Engineer.
Montana	Billings	February 4, 5 P.M.	Sewer, 3,000 lin. ft., 12 manholes, 15 catch basins, etc	J. D. Matheson, City Clerk.
Public Buildings				
Tennessee	Memphis	December 5, noon	Painting the City Hospital	Ennis M. Douglass, City Register.
Maine	Waldoboro	December 5, 3 P.M.	Erecting extension to Federal Building	James Knox Taylor, Wash., D. C.

Public Buildings—*Continued.*

Texas	Beaumont	December 6	Erecting a ward school in North End	Board of School Trustees.
Ontario	Simcoe	December 6	Erecting a public building	Fred. Gelinas, Sec'y Dept. Pub. Wks.
Massachusetts	Boston	December 6	Additions to and alterations in Relief Station Hospital; separate bids for plumbing, heating and electric work	Kendall, Taylor & Co., Architects.
Michigan	Saginaw	December 6	Erecting fire station and hose house, 19th Ward	J. Stingel, Pres. Bd. Pub. Works.
Texas	Abilene	December 6	Erecting 2 buildings for Epileptic Colony; also plumbing, etc.	Sec'y Bd. Comrs. Epileptic Colony.
New York	Remsen	December 7, 5 P.M.	Erecting Didymus Thomas Library Building	Walter G. Frank, Utica, Arch.
Illinois	Chicago	December 9, 2 P.M.	Constructing new armory for Seventh Reg't I. N. G.	W. C. Zimmerman, State Arch.
California	Berkeley	December 9, 7:45 P.M.	Constructing $10,000 Town Hall, of concrete and steel	Bakewell & Brown, San Fran., Archs.
Ohio	Cincinnati	December 9	Erecting high school; bids separate or whole	Dr. J. M. Withrow, Bd. Educ.
Pennsylvania	Warnersville	December 9	Erecting Infirmary and ext. to dining room; State Asy. for Ins.	A. A. Ritcher, Reading, Arch.
Illinois	Carbondale	December 10, noon	Erecting model school building So. Ill. State Normal Univ.	Hugh Lauder, Sec'y Bd. Trustees.
Texas	Alpine	December 10	Erecting 2-story brick, stone and concrete block school	H. T. Phelps, San Antonio, Arch.
Tennessee	Chattanooga	December 10	Erecting new City Hall, to cost about $190,000	R. H. Hunt, Architect.
New Jersey	Bayonne	December 10	Erecting school No. 10; separate bids on plumbing and gas fitting and Warren Webster ventilating and heating system	J. F. Desmond, Sec'y Bd. Educ'n.
Dist. of Col'bia	Washington	December 11, noon	Furn. sheet copper, 6,250 sheets 24 x 96 ins., or 100,000 sq. ft.	Elliott Woods, Supt. U. S. Capitol.
Arizona	Whipple Barracks	December 12, 11 A.M.	Erecting, plumbing, heating, electric wiring, hospital	Capt. Chas. C. Walcott, Jr., Q. M.
Indiana	Terre Haute	December 14	Erecting County jails; $125,000 available	County Commissioners.
Minnesota	Northfield	December 14	Erecting a ladies' dormitory at St. Olaf College	Paul G. Schmidt.
Alabama	Auburn	December 15	Erecting $30,000 library for Polytechnic Institute	C. C. Thach, President, Inst.
Tennessee	Pulaski	December 16, noon	Erecting 2-story and base. brick and stone fireproof Court House	B. B. Smith, Montgomery, Ala., Arch.
Mississippi	Ellisville	December 16	Erecting jail at Ellisville; also one at Laurel	W. H. Bufnin, Chancery Clerk.
Oklahoma	Pawnee	December 17, 2 P.M.	Constructing dormitory at Pawnee Indian School	Geo. W. Nellis, Superintendent.
Michigan	Detroit	December 17, 3 P.M.	Erecting, complete, extension to Federal Building	James Knox Taylor, Wash., D. C.
Florida	Ocala	December 19, 3 P.M.	Erecting, complete, Federal Building	James Knox Taylor, Wash., D. C.
Ohio	Dayton	December 19	Erecting west wing of Manual Training High School	Wm. G. Haeussler, Clk. Bd. Educ'n
Ohio	Youngstown	December 21	Ventilating and heating new County Court House	Owsley & Boucherle & Co., Archs.
Michigan	Ann Arbor	December 23, 3 P.M.	Constructing, complete, U. S. Post Office	James Knox Taylor, Wash., D. C.
Washington	Tulalip	December 27, 2 P.M.	Bldg. dormitory, hospital, power house, etc., Indian School	Chas. M. Buchanan, Supt.
Pennsylvania	Lancaster	December 30, 3 P.M.	Erecting, complete, extension to U. S. Post Office	James Knox Taylor, Wash., D. C.
Illinois	Paris	December 31	Erecting a $60,000 high school	Reeves & Baillie, Peoria, Archs.
Indiana	South Bend	January 2, 3 P.M.	Erecting extension and remodeling U. S. Post Office	James Knox Taylor. Wash., D. C.
Michigan	Flint	January 2	Constructing a City Hall; cost $65,000 or $75,000, except heating, etc.	D. E. Newcome, City Clerk.
New Mexico	Albuquerque	January 3, 3 P.M.	Constructing, inc. plumbing, heating, etc., U. S. Post Office	James Knox Taylor, Wash., D. C.
Ohio	Cincinnati	January 6, noon	Constructing new high school, Clinton Ave. & McMilan Street	Dr. J. M. Withrow, Chm. Bldg. Com.
Kansas	Wichita	January 6, 3 P.M.	Erecting, complete, extension to Federal Building	James Knox Taylor, Wash., D. C.
Michigan	Coopersville	January 6	Constructing a $16,000 school	F. E. Payne, Sec'y Bd. Educ'n
Minnesota	Slayton	January 7, 8 P.M.	Erecting brick addition to school, Dist. No. 52	B. H. Whitney, Clk. School Bd.
Georgia	Cairo	February 1	Erecting $40,000 County Court House; also $13,000 jail	Alex. Blair, Macon, Architect.

Bridges

Wisconsin	River Falls	December 5	Erecting steel truss bridge over Kinnickinnic River at Cedar St., 140 ft. long, concrete floor, 20 ft. wide, 5-ft. walks, abutments	Allen P. Weld, City Clerk.
Wisconsin	Menominee	December 6	Erecting $30,000 bridge over Red Cedar River	F. W. Rowe, City Clerk.
Wisconsin	La Crosse	December 6	Erecting steel bridge over Black River; also laying new girders and flooring in McGilvray bridge	C. H. Rawlinson, County Clerk.
New York	New York	December 9, 2 P.M.	Constructing masonry piers, surface and sub-surface changes, and steel superstructure of approaches new Brooklyn bridge	J. W. Stevenson, Com'r Bridges.
Kansas	Girard	December 9	Building 3 stone substructures; also two 10-ft. stone arches	Fred A. Gerren, County Clerk.
Minnesota	Jackson	December 10	Erecting 100 ft. steel bridge and approaches	P. D. McKellar, Co. Auditor.
Kansas	Girard	December 10	Building iron superstructure for 4 I-beam and 70-ft. truss bridge	Fred A. Gerren, County Clerk.
Hawaii	Wailuku, Maui Co.	December 11, 2 P.M.	Three steel bridges	W. F. Kane, County Clerk.
Ohio	Celina	December 13	Erecting 2 steel bridges, each 64 ft. long, 16 ft. roadway	T. A. Weiss, Auditor Mercer Co.
Ohio	Norwood	December 14	Erecting substructure of viaduct over B. & O. S. W. Ry	Jas. A. Stewart, Cincinnati, C. E.
Spain	Madrid	December 14	Erecting 14-meter wide bridge over Manzanares	Public Works Department.
Pennsylvania	Philadelphia	December 17, noon	Building bridges Berks to Broad St., in con. with grade crossings	W. Hunter, Ch. Engr. P. & R. Ry.
Indiana	La Fayette	December 18, 10 A.M.	Constructing bridge near Granville	John Foresman, Co. Auditor.
China	Canton	December 31	Constructing steel cantilever and girder bridge, 1,102 ft. long, in the Front Reach, Canton	Canton River Bridge Co.
Kansas	Topeka	December 31	Building $60,000 steel viaduct at Branner St., for Topeka St. Ry. Co., etc	A. M. Patten, Gen. Supt.
Louisiana	New Orleans	January 2, 1 P.M.	Erecting Bascule Trunion bridge over Bayou St. John	Charles R. Kennedy, Comptroller.
South Dakota	Salem	January 7	Building all bridges in McCook County during coming year	C. J. Black, Co. Auditor.
North Carolina	Castle Haynes	January 7	Constructing steel bridge, 400 ft., inc. draw span and foundations, 16 ft. roadway, carry 15-ton road roller; water 32 feet deep	D. McEachern, Wilmington.
Missouri	St. Charles	February 13	Erecting Cuivre River bridge at Old Monroe; cost, $8,000	County Commissioners.

Lighting and Electricity

Ohio	Newburgh	December 5	Furnishing, lighting, extinguishing and keeping in repair, inc. furn. gas, gasoline, etc., 140 st. lights for one year	Wm. H. Jentzen, Clk., Bd. Pub. Serv.
Pennsylvania	Erie	December 9	Lighting streets for term of years	B. E. Briggs, City Engineer.
New York	New York	December 10, 2 P.M.	Furn. lamps and gas and naphtha and maintaining lamps in sts., parks and buildings, 1 year from Jan. 1; also furn., install. and maintain. gas regulators during year; and furn. steam for heating or power purposes during year	John H. O'Brien, Com'r W. S., G. & E.
Massachusetts	Fort Revere	December 10	Furnishing and installing electric light fixtures in hospital	Capt. C. O. Zollars, Q. M., U. S. A.
Quebec	Montreal	December 16	Supplying electricity and gas for lighting, heating, etc	L. O. David, City Clerk.
Indiana	Washington	December 16	Purchase city's stock in Washington Light and Water Co	Robert Russell, Mayor.
Texas	Fort Worth	December 20, 3 P.M.	Conduit and electric wiring system, exten. to U. S. Post Office	James Knox Taylor, Wash., D. C
Ohio	Ashville	December 20, 6 P.M.	Furn. all material, except copper wire and arc lamps, and building system of electric street lighting, in con. with Scioto Val. Tr. Co.	R. Fullerton, Ch. Electrician, Scioto Valley Traction Co., Columbus.
Indiana	La Fayette	December 20	Lighting the city for 10 years, from September, 1908	R. H. McGrath, Pres. Bd. Pub. Wks.
Indian Terr'y	Red Fork	December 20	Constructing electric railway and power plant to serve Red Fork, Tulsa, W. Tulsa and Glen Pool; cost of plant, $100,000	J. Robert Burnham, Tulsa, Engineer, Mid-continental Traction Co.
Montana	Chinook	December 21, 2 P.M.	Constructing an electric light system	John C. Duff, City Clerk.
Washington	Tulalip	December 27, 2 P.M.	Constructing electric lighting system at Indian School	Dr. Chas. M. Buchanan, Supt.
India	Calcutta	December 31	Lighting town by electricity, gas, oil or other method; now lighted by 9,300 gas lamps of 24 c.p. and 2,400 c.p. oil lamps	Municipal Council.
Nebraska	Wood River	January 15	Constructing $17,000 electric light and water works plant	D. D. O. Kane, Village Clerk.

Miscellaneous

Ohio	Minerva	December 4	Furnishing 150-horsepower boiler	L. E. Weber, Sec'y Bd. Pub. Serv.
Pennsylvania	Altoona	December 4	Collection and sanitary disposal of garbage, 1, 3, 5 or 10 years	Samuel B. Frees, Sec'y Bd. Health.
New York	New York	December 5, noon	Furn. 10,000 North River red brick, 8,000 square fire brick, 5,000 end wedge fire brick, 50 bbls. fire clay, 30 cu. yds. sand	F. Crowell, Com'r St. Cleaning.
New York	New York	December 5	Furn. iron, steam fittings, lumber and miscellaneous articles	John V. Coggey, Com'r Charities.
Dist. of Col'bia	Washington	Dec. 6, 10:30 A.M.	Furn. pumps, pneumatic tools, hose, repair parts of steam shovels, iron pipe and fittings, etc., Isth. Canal Com'n	Col. H. F. Hodges, Gen. Pur. Agent.
New York	Brooklyn	December 6, 2 P.M.	Furnishing special cross-heads for lamp-posts	J. H. O'Brien, Com'r W. S., G. & E.
Dist. of Col'bia	Washington	December 6	Furn. 600 miles No. 12, and 1,200 miles No. 9 B. B. galvanized iron wire, 60,000 12-in. brackets; 60,000 standard No. 9 pony glass insulators, U. S. Forest Service	W. N. Hays, Act. Sec'y Agriculture.
Dist. of Col'bia	Washington	December 10, 2 P.M.	Furn. c. i. radiators for hot water heating Nat'l Mus. Bldg	Bernard R. Green, Supt. Constr'n.
New York	No. Tonawanda	December 10	Furnishing 2,000 ft. fire hose	Geo. H. Smith, City Clerk.
Wisconsin	Superior	December 10	Constructing dock for Pittsburg Coal Co	C. J. A. Morris, Consulting Engr.
Dist. of Col'bia	Washington	December 11, noon	Furn. 6,250 sheets, 24 x 96-in. or 100,000 sq. ft. sheet copper	Elliott Woods, Sup't Capitol.
Iowa	Emmetsburg	December 11, 1 P.M.	Constructing work in nine Drainage Districts	Sim. R. Stedman, Co. Auditor.
Louisiana	New Orleans	December 11	Thirty-year franchise, beginning June 30, 1912, to construct, maintain and operate electric street railway through several sts., including St. Bernard Ave. and Broad St.	Chas. R. Kennedy, Comptroller.

Miscellaneous—*Continued.*

Tennessee.....	Nashville.....	December 14, 11 A.M.	Furnishing 1,258,695 ft. B. M. long-leaf yellow pine lumber.....	Maj. Wm. W. Harts, U. S. Eng'rs.
Pennsylvania...	Philadelphia.....	December 17, noon...	Grade crossing work on P. G & N. A. R., inc. masonry, trestle and embankment, paving, engine yards, etc.....	W. Hunter, Chief Engr. P. & R. Ry.
New Jersey....	Fort Hancock...	December 17, 2 P.M..	Constructing a garbage crematory.....	Capt. M. N. Falls, Q. M., U. S. A.
New Jersey....	West Orange....	December 17.....	Removal of garbage and ashes, west of mountain.....	Town Council.
Wisconsin.....	Madison.....	December 18, noon. .	Bldg. concrete tunnel from power plant to new Capitol; also wrecking east wing of old Capitol building.....	Lew F. Porter, Sec'y Capitol Com'n.
Tennessee..	....Chattanooga....	January 7.....	Screen wagon service between P.O. and depts.4 years, rural deliv'y	W. Scott Raulston, Postmaster.
Ohio.....	Columbus.....	January 14, noon....	Design, construction, delivery and erection of garbage reduction works, capacity 100 tons per 24 hours.....	Henry Maetzel, Ch. Engr. D. P. S.

STREET IMPROVEMENTS

San Francisco, Cal.—The Ferry District Improvement Association is considering the construction of a viaduct from the foot of Market street, east to the second story of the Ferry building. Plans and specifications for the proposed viaduct are being prepared and the co-operation of the city, State and the United Railroads will be solicited in putting the project through. A rough estimate of the cost of the viaduct is placed at $35,000, of which it is thought that the State will pay one-half.

Elgin, Ill.—The property owners of the North End have petitioned that arrangements be made for paving the streets.

Bedford, Ind.—The Commissioners of Lawrence county are preparing to ask for bids for constructing macadamized streets and roads in and about the vicinity of Mitchell; $30,000 is about to be expended.

Evansville, Ind.—A resolution for the construction of a brick sidewalk on both sides of Fountain avenue, from Fulton avenue to State street, has been passed.

Waterloo, Ia.—The Engineer has given estimate of cost of building bridge across the cut-off at Sans Souci Park, at $7,500; the Waterloo-Cedar Falls Railway Company must build bridge before March.

Lynn, Mass.—Detailed plans have been prepared by Frank A. Barbour, of Boston, for the proposed abolition of the Boston and Maine grade crossings in Lynn; estimated cost, $1,129,000, exclusive of land damages.

Cadillac, Mich.—Bids may soon be asked for paving with brick, bitulithic and concrete 23,888 square yards.

Hancock, Mich.—The Houghton County Street Railway Company reports to the Council the unsafe condition of the Front street bridge.

Jackson, Mich.—Bids will probably soon be asked for paving West Main and First streets.—A. W. D. Hall, City Engineer.

Kalamazoo, Mich.—The City Engineer's force is getting out the estimates and files for the streets, which it is expected will be paved next year. The work already ordered done by the Council includes Elm street from Main street to Kalamazoo avenue, Douglas avenue from Main to North street, Stuart avenue and Church streets for the same distance, Burdick street from North to Paterson street, Porter street from Main to Water street, Vine street from Burdick to Davis street, and Spring street from Portage to Pitcher street. Residents of Walnut street between Burdick and West streets, have also asked that the Council order that street paved.

Lansing, Mich.—Council has directed the City Clerk to advertise for bids for the purchase of $12,000 paving bonds, payable in the years 1908 to 1912 inclusive.

Duluth, Minn.—Council proposes to build a steel viaduct across the railway tracks from Banks avenue and Third street; to build a steel viaduct over all of the tracks, City Engineer Banks says will cost approximately $20,000.

Joplin, Mo.—The matter of issuing bonds for building Third street viaduct is under consideration.

St. Charles, Mo.—Council has decided to issue $10,000 street improvement bonds.—Address City Clerk.

St. Joseph, Mo.—The matter of issuing $500,000 bonds for good roads is under consideration by the voters of Buchanan County.—Address County Clerk.

Omaha, Neb.—Douglas County will expend $150,000 in improving county roads.

Ashtabula, O.—Council has voted to have plans and specifications prepared by the Engineering Department for grading and draining Manning street, from Columbus to Cole street, and Second street, from Columbus street to the property of the Lake Shore & Michigan Southern Railway Company. Plans and specifications have been prepared for grading and draining Pennsylvania avenue, from Walnut to Hubbard street, and Madison street, from Holly to South street.

Carrollton, O.—The residents of West Canal street have petitioned to have that street paved this fall and are negotiating with Contractor Freshwater for the improvement.

Chester, O.—It is proposed to have Second street paved early in the spring.

Cincinnati, O.—Property owners in David street between Central and John streets have asked that this section be paved with asphalt.

Cleveland Heights, O.—Bids will be received, December 10, for the purchase of $9,669 5 per cent. sidewalk bonds.—Wm. G. Phare, Village Clerk.

Columbus, O.—Council has passed an ordinance authorizing issue of $1,000,000 grade crossing bonds; the bonds will be advertised and sold at once.

Dayton, O.—City Engineer Robert Kline has submitted estimates for the paving of Linwood street, from Emmett to Locust; Bacon, from Clinton to Dutoit; Hickory, from Brown to Wayne avenue; College, from Third to Fifth, and for intersections on River street, from Chicago to Orth avenue.

East Liverpool, O.—City Engineer Kelly states that it is proposed to pave Erie street; plans are to be immediately prepared.

Council will be asked to pave Indiana avenue.

Sandusky, O.—Estimates of the cost of paving Decatur street have been referred to the Engineer; cost, about $24,000.

Zanesville, O.—The County Commissioners have decided that the petition to pave the Fraykesburg road with vitrified brick, a distance of one mile beyond the city limits, will be granted; plans will be prepared at once and bids invited.

Portland, Ore.—City Attorney Kavanaugh has given an opinion that all proceedings for the improvements for streets would be illegal during the holidays, and advised the City Executive Board that no action should be taken in any proceedings.

Avalon (Allegheny post-office), Pa.—Bonds for $75,000 have been voted for street improvements.

Philadelphia, Pa.—Officials of the Highway Bureau are hard at work on plans for the relief of traffic congestion around the northern side of the City Hall, and their scheme, which provides for the widening of Filbert street along the northern facade, will be submitted to Councils in the near future; the plan is to make the roadway eight feet wider before the repaving is undertaken upon the completion of the subway; all that will be necessary to make the change along the plaza will be to take the eight feet off the present plaza, bringing the curb line that much nearer the City Hall.

Columbia, S. C.—It is estimated that the cost of paving Main street will be $150,000 to $175,000; the street car company will come in for about one-third of the expense; the contractors will have several sub-contracts to let, including hauling.

Chattanooga, Tenn.—Paving districts have been created on Market street, between Fourth and Sixth streets; west side Market street, between Sixth and Seventh streets; Sixth street, between Market and Broad streets, and Walnut street, between First and Broad streets; contracts for the permanent improvement of these streets will be awarded in about two months.—Robert Hooke, City Engineer.

Chehalis, Wash.—Bids have been asked for macadamizing Washington, School, Adams and Park streets; a resolution has been passed providing for the pavement of about nine blocks more in the business center of the city, on Chehalis avenue, Pacific avenue, Park street and Front street; estimate, about $50,000.

Spokane, Wash.—The Board of Public Works has been authorized to advertise for plans and estimates for the East Sprague avenue fill.

Ordinances have been passed to grade, curb and sidewalk Carlisle avenue, Lidgerwood street to Hamilton street; grade, curb, park and sidewalk Seventh avenue, Oak street to Cannon street; curb, park, sidewalk and ballast Arthur street, Eighth avenue to Ninth avenue; grade, curb, sidewalk and ballast Arthur street, Eighth avenue to Grand street to Hatch street; paving Sprague avenue, Browne street to Arthur street.

Racine, Wis.—It is contemplated to lay asphalt pavement on Monument Square, and East State street and Main street, and brick pavement on Grand avenue; the cost is being ascertained.

SEWERAGE

Waterbury, Conn.—Bids will be opened December 16 for $125,000 4 per cent. sewer bonds.—William H. Sandland, City Clerk.

Waterbury, Conn.—Bids will be received, December 16, for the purchase of $125,000 4 per cent. 50-year sewer bonds.—Address City Treasurer.

Bloomington, Ill.—A 12-inch vitrified-pipe sewer will be constructed in Clay street, between Lee street and Mason street, north; also in Washington street, between Allin and Howard streets.

Elgin, Ill.—Plans have been completed by City Engineer Plum for proposed sewer system for the Sixth Ward.

Galva, Ill.—The Board of Local Improvements has directed plans to be prepared for sewer system, estimated to cost $30,000.

Hegewisch, Ill.—Estimates are being made to establish sewer system, estimated to cost $90,000.

Herrin, Ill.—Construction of sewer system here is advocated.

Rock Island, Ill.—The city is securing right-of-way for its projected $106,000 sewer construction of which is to be started in the spring.

Wellington, Kan.—Plans for a sewer system are practically completed; bids for construction will be asked soon.

Shelbyville, Ky.—City has voted $30,000 of bonds for building sewer system.

Fenton, Mich.—Plans and estimates are being made for sewer system.—Riggs & Sherman, Toledo, O., Engineers.

Morenci, Mich.—The town has decided to bond itself in the sum of $90,000 for a sewerage system and water works plant.

Mankato, Minn.—Council proposes to establish additional sewers.

St. Paul, Minn.—The City Engineer has submitted preliminary estimates of cost of new sewer in Prior avenue to Board of Public Works, to cost $30,500.

Joplin, Mo.—An election will be held, December 9, to vote on the question of issuing $96,000 sewerage bonds.

St. Louis, Mo.—A bill has been introduced in Council providing for $140,000 for constructing Galize Creek sewer.

Orange, N. J.—Bonds, $30,000, have been authorized for sewers.

Trenton, N. J.—Sewer No. 402 is to be built in Olden avenue.

Bellefontaine, O.—The Clerk is about to readvertise for bids for sewer work.

Cincinnati, O.—Plans for a sewer system in the annexed territory formerly the village of Westwood have been presented to the Board of Public Service.

Eaton, O.—Bids will be received, December 16, for the purchase of $10,000 4½ per cent. sewerage bonds.—C. F. Ressler, Village Clerk.

Mingo Junction, O.—Bids will be received, December 23, for $50,000 5 per cent. sewer bonds.—Frank McLister, City Clerk.

New Philadelphia, O.—The town is planning to put in a sewer system, to cost $100,000; E. G. Bradbury, of Columbus, has prepared the preliminary estimate.

Orrville, O.—Plans and specifications have been completed for sewer system.

Zenia, O.—Trustees of the Ohio Soldiers' Sailors' and Orphans' Home have asked for $100,000 to install a complete sewerage system and power plant.

Carlisle, Pa.—The city will vote on issuing $150,000 bonds for constructing sewer system.

Erie, Pa.—Contractors Simpson and Willis have given up the contract for the sewer in Cascade street and the city will readvertise at once.

Glenshaw, Pa.—The State Health Department has granted Glenshaw Village, Shaler Township, a permit to build sewers.

Jeanette, Pa.—The Borough Council will shortly ask bids for constructing sewer.

New Castle, Pa.—Specifications for the construction of sanitary sewers on O'Brien, Fulton, Davis, Moravia and Winter streets have been approved by the Sewer Committee.

New Cumberland, Pa.—Public meeting will be held to arrange for a $30,000 sewer system.

Donie, Tex.—Bonds, $15,000, have been authorized for sewer purposes.

Galveston, Tex.—In accordance with recommendations of the City Engineer it has been ordered that all the bids for the drainage work on West Market street be rejected and that authority be granted to advertise for bids for the concrete drain work as recommended by him.

Knoxville, Tenn.—Bids are to be asked for the extension of the First Creek sewer in the Eleventh Ward; the improvement will cost about $14,000.

Prairie View, Tex.—Bids will probably soon be asked by the Board of Directors of the Agricultural and Mechanical College for the construction of a sewer system at the Prairie View Normal School; estimated cost, $5,000.—C. E. Andrew, College Station, Tex., Secretary Board of Directors.

Appleton, Wis.—Special election will be held, December 17, to vote on purchase of old water works.

Montreal, Canada.—The Council Finance Committee has voted $40,000 for building sewer in Villeray.

WATER SUPPLY

Headland, Ala.—Election is to be held to vote on issuing bonds for constructing water works and electric light plant.

Vallejo, Cal.—The city may expend $70,000 in enlarging its storage water supply system.

Greeley, Colo.—W. R. Wilson, of Denver, is interested in a company organized to build a system of reservoirs.

Wilmington, Del.—Electricity has destroyed water pipe in various parts of the city.

Palatka, Fla.—The city has voted $10,000 water works bonds.

Dallas, Ga.—The citizens have voted $30,000 bonds for the construction of water works.

Elgin, Ill.—The Water Board is considering the matter of building a standpipe.

Evansville, Ind.—Council has decided to install mechanical filtration plant.

Jeffersonville, Ind.—The Trustees of State Reformatory will ask Legislature for an appropriation for installing independent water system for the Reformatory.

Anamosa, Ia.—The citizens have voted $30,000 water works bonds.

McPherson, Kan.—A committee of which Mayor L. C. Criner is a member, has been appointed to arrange, if possible, for purchase by city of plant of McPherson Water & Light Co.; Council has ordered the water company to extend its mains on several streets.

Wichita, Kan.—Hiram Phillips, Consulting Engineer, 615 Frisco Building, St. Louis, Mo., has been employed to draw plans for a new system of water works, and also to make estimate of the present worth of the Wichita Water Company's plant.

Morenci, Mich.—Bonds, $90,000, have been voted for water works and sewer system.

Norway, Mich.—The Board of Public Works has decided to employ an expert to determine the best source from which the city may secure a new water supply.

Brookfield, Mo.—The citizens have voted $11,000 for the improvement of the water system.

Atlantic City, N. J.—A complete duplicate water plant is to be installed to furnish the resort with an extra supply of pure water, under plans of Water Superintendent Van Gilder. He condemns the intended scheme of installing large storage reservoirs in this city and favors the building of new pumping stations and laying new mains across the five-mile stretch of meadows from Absecon. Nearly $250,000 will be required for the work.

Verona, N. J.—Bonds have been voted for installing water plant; an ordinance has been passed on first reading to lay water pipes in all streets of the borough; estimated cost, $55,000.

Cincinnati, O.—One of the matters to be taken up by the Board of Public Service of the incoming administration is the change from the "survey" system of water rentals to the meter system; at present there are 6,200 consumers of water on the meter system, while some 42,000 are on survey; the cost of supplying these with meters is estimated at $420,000; at present the consumer buys the meter used.

Delta, O.—The people will vote in December on the proposition to issue bonds in the sum of $25,000 for the purpose of erecting a water works plant.

Fostoria, O.—The $20,000 filtration plant, plans for which were made by County Engineer Peters, of Tiffin, were not adopted; Engineers Riggs and Sherman have been retained to prepare new plans.

Westerville, O.—B. F. Neff will be granted a franchise for an up-to-date water works system for the village of Worthington.

Youngstown, O.—It is estimated that nearly $150,000 will have to be expended here during the next year in the construction of new reservoirs for the Water Works Department; an expenditure of this kind is necessary for the purchase of a 20,000,000-gallon pump.

Claremore, Okla.—Plans and specifications are being prepared by Engineers Burns & McDonnell, Scarrett Building, Kansas City, Mo., for the new water supply and remodeling the water works plant; the new plant recently completed is without water and the proposed improvements contemplate securing water from the Verdigris River; no date has yet been set for receiving bids for equipment.

Columbia, S. C.—The city may find it necessary to put in water mains, one on each side of Main street, before the paving is laid, as the big main between the car tracks is said to be subject to electrolysis.

Lebanon, Tenn.—The citizens have voted $10,000 bonds for building reservoir.

Commerce, Tex.—Council has directed estimates to be prepared for water system, to cost $16,000.

Denison, Tex.—The city has secured an option on the farm of Congressman Randall for the water works plant; the farm embraces 800 acres and is three miles west of Denison; the work on the new water works plant will begin early next spring.

Seattle, Wash.—The ordinance authorizing the construction of a system of high-pressure salt water mains in the business portion of the city, to be used for fire protection, has been passed by the City Council; estimated cost, $340,000.—R. H. Thomson, City Engineer.

Spokane, Wash.—Council, acting on recommendations from Mayor Moore and the Board of Health, with which were submitted the reports of experts, has ordered the Board of Public Works to proceed at once with the installation of the necessary machinery for the development of the underground flow of water as a source of supply.

Fayettesville, W. Va.—The Fayettesville Water and Light Company has been organized and incorporated with $25,000 capital and secured the necessary water rights, franchises, etc., and will build a 25-foot dam in Wolf Creek; the company will also erect a lighting plant, first-class in every particular; H. Jos. Hawkins is at the head of the enterprise.

Oshkosh, Wis.—The Oshkosh Water Works Company proposes to extend water mains.

LIGHTING AND ELECTRICITY

Columbiana, Ala.—The Columbiana Light and Power Company has engaged E. N. Cunningham, of New Orleans, La., to prepare plans for the installation of an electric light plant; after plans are completed, bids will be received on equipment for complete plant.

Sulphur Springs, Ark.—Plans are being prepared by Smith & Powers for a combined electric light plant and water works system, to cost about $25,000.

Bakersfield, Cal.—The Santa Fe Railway Company is asking for bids for the construction of a power-house and electric plant.

Berkeley, Cal.—C. S. Forney is interested in organizing a company to establish an electric light plant.

Chico, Cal.—L. D. Macy has been granted franchise to construct and operate an electric light, heat and power system.

Denver, Col.—A. E. Wilson is interested in the company being organized with a capital of $1,000,000 for the generation of 20,000 horsepower on the South Platte River, a short distance from Denver.

Bonifay, Fla.—C. A. Miller intends to install an acetylene gas plant for lighting stores and dwellings.

Jacksonville, Fla.—The Lester Clay Company, Jacksonville, will receive bids for constructing an electric light plant, consisting of from 75 to 100 lights.

Leesburg, Fla.—The question of holding an election to vote on electric light bonds is under consideration.—Address Mayor Dozier.

Cairo, Ill.—The Cairo Electric and Traction Company, Cairo, Ill., is to make improvements to its plant, and will let contracts for two 500-k.w. turbine generators, one 300-k.w. motor generating set and one 200-k.w. motor generating set.—O. C. Macy, Manager.

Decatur, Ill.—The Wabash Railway Company will have its own electric plant for lighting station and roundhouse; the company will also furnish light for the city.

Fort Wayne, Ind.—The Board of Public Works will offer for sale at once $70,000 bonds authorized for lighting purposes.

Knightstown, Ind.—The managers of the municipal electric light plant are contemplating increasing the output of the plant and will install a 100-k.w., 2,300-volt, 3-phase, 60-cycle Curtis steam turbine and two boilers of 175 h.p. each.—F. S. Wilson, Superintendent.

Kokomo, Ind.—O. D. Ross, of Peru, and Philip H. Palmer, of Kokomo, an electrician, have taken an inventory of the lighting plant of Lewis Barger, of Converse, and placed a value on it of $14,404.75; Fred Wilson, of Marion, has a claim against the plant for about $10,000, and the property will be sold at Sheriff's sale.

Lafayette, Ind.—The Board of Public Works have adopted specifications drawn by Prof. Walter Esterline, of Purdue University, for lighting the streets and alleys of the city, to go into effect after the expiration of the present contract with the Lafayette Gas Company, on September 1, 1908.

Roanoke, Ind.—A company is being organized to establish an electric light plant.

Vincennes, Ind.—The Black Hawk Light, Heat and Power Company, recently incorporated with a capital of $1,000,000, will soon let contracts for the laying of natural and artificial gas mains, for the construction and equipment of gas and light plants in the several towns and cities in Southwestern Indiana; W. C. Reger, Henry Tapping and H. C. Bauer are interested.

Wabash, Ind.—Plans are being completed by the Logansport and Wabash Valley Gas Company, Wabash, for an extension of its mains in the various cities in which it operates; the South Side, in which there has been no gas, will be supplied.

Pella, Ia.—The Pella electric light plant has been purchased by Henry Rhynsberger and Walter Fowler, of this city, and they will at once overhaul the plant and put it in first-class shape.

Wichita, Kan.—There is to be built in Wichita a heat, power, light and space plant for the purpose of encouraging and aiding small manufacturers; the new company will be known as the Wichita Heat, Light, Power and Space Company; its capital will be $250,000 at the outset.

Midway, Ky.—The franchise for establishing and maintaining an electric lighting and power system and for the using of the streets and alleys of the city for that purpose, has been purchased by the Versailles Electric Light Plant.

Flushing, Mich.—Council has decided to purchase another engine for use in the electric light plant.

Fowlerville, Mich.—The Fowlerville Light Company is organized in the sum of $15,000; the incorporators are Lewis P. Cody, Amazon Antisdel and others.

Glenwood, Minn.—The owners of the power plant contemplate installing a 220-h.p. engine.—H. Petersen, Secretary.

Billings, Mont.—Yegen Brothers have petitioned for ten-year franchise to light streets and public buildings; J. D. Losekamp has petitioned for franchise for establishing a gas plant.

Blair, Neb.—Charles C. Stanley, of Chicago, has petitioned Council for franchise to erect a lighting, heating and cooking gas plant.

Atlantic City, N. J.—A. W. Farrand, City Electrician, has reported that it will cost $200,000 to place all of the electric lighting wires under ground in the city; under an agreement between the city and the companies, the work will be commenced in the spring and completed in three years.

Lima, N. Y.—The Lima and Honeoye Electric Light and Railroad Company contemplates erection of a power station, to be located in the gas fields, four miles south of Lima.—E. D. Watkins, Manager.

Tryon, N. C.—E. W. Hall, Oak Hall Hotel, Tryon, is interested in installation of machinery for a gas plant to supply a town of 8,000 population.

Cleveland, O.—In addition to the power plant which has been erected and equipped on East Third street, adjoining the Hermit club-house, President John C. Keys, of the Cuyahoga Light Company, states that just as soon as the franchises pending before the Council are ratified, the company will proceed to erect four more power plants in down-town sections of the city.

Cuyahoga Falls, O.—C. M. Walsh has received a franchise for constructing a heat, power and lighting plant in this city; his contract runs for 25 years.

New Bremen, O.—The city has voted to issue $25,000 of bonds for installing municipal lighting plant.

Clinton, Okla.—Council has granted a franchise to establish an electric light and power plant to F. Murch, of Hennessy.

McAdoo, Pa.—Council in conjunction with the Citizens' Committee is considering the disposal of the electric light plant; a number of bids have been submitted for the purchase of the plant.

South Pittsburg, Tenn.—D. A. Tate has purchased the municipal electric light and power plant and will install new equipment, provide new wiring, etc.; city has granted exclusive franchise for ten years and perpetual franchise thereafter; Mr. Tate agrees

to furnish city fifty 50-c.p. street lights free for five years, representing a purchase price of about $3,600.

Eau Claire, Wis.—Council has decided to ask for bids for lighting the streets with either gas or electricity for a period of five years.

Wittenberg, Wis.—The Viking Lumber Company, of Wittenberg, has submitted a proposition to the village to furnish a certain number of arc street lights; the Viking Lumber Company has recently completed a new and expensive dam which will give them plenty of power, and they have made the people of Eland a liberal offer.

Campbellford, Ont., Can.—John S. Fielding, 15 Toronto street, Toronto, is engineer for the proposed power plant, which is to be constructed at Middle Falls; the cost is estimated at $60,000.—E. C. West, City Secretary.

FIRE EQUIPMENT

Oakland, Cal.—A resolution has been passed authorizing the Board of Public Works to purchase for use of the Fire Department additional equipment.

Bridgeport, Conn.—Contracts for the Maplewood avenue chemical engine house are to be executed immediately.

Savannah, Ga.—The city has appropriated $10,000 for erecting a fire station in the Collinsville suburb.

Topeka, Kan.—Council has been asked to authorize the purchase of 1,000 feet of new hose for the Fire Department.

Ferriday, La.—A fire company is being organized; steps will be taken to purchase fire apparatus.—Dr. E. H. Smith, Chief.

New Orleans, La.—The Fire Board proposes to purchase an additional supply of hose.

Cambridge, Mass.—Appropriations for Fire Department, rebuilding Engine 2, $2,540; general expenses, $1,500; salaries, $814, have been made.

Prattville, Mich.—A fire occurred at this place; the town is without fire protection; apparatus will be secured.

Saginaw, Mich.—Bids will be asked for new fire station at Sherman and South Michigan avenue.

Mankato, Minn.—The Fire Chief has petitioned for the purchase of an aerial truck, with a 65-foot ladder.

Bay St. Louis, Miss.—A disastrous fire occurred, as the town is without fire apparatus; measures will be taken for protection.

Joplin, Mo.—The ordinance calling for a special election to increase the indebtedness of the city by $25,000 for the improvement of the Fire Department has been passed.

East Orange, N. J.—Council proposes to build a fire house in the Fifth Ward.

Ashtabula, O.—Council proposes to purchase two additional fire engines.

Kenton, O.—Bids will be received, December 6, for the purchase of $5,000 Fire Department bonds.—John Y. Thompson, City Clerk.

Enid, Okla.—The city offers for sale $25,000 bonds for fire protection.—E. B. Lee, City Clerk.

West Scranton, Pa.—The city has secured an option on a West Scranton property for the purpose of erecting a combination fire and police headquarters.

Chattanooga, Tenn.—The firm of Beardin & Foreman has been formally employed by the Board of Public Works as architects and superintendent of the construction of the new No. 6 fire hall, at Sixth and Prospect streets.

Oceana, W. Va.—A disastrous fire occurred, as the town is without fire protection; apparatus will probably be procured.

Milwaukee, Wis.—Arrangements are being made to erect a fire station on Broadway and Martin streets.

Westfield, Wis.—The Westfield Fire Department proposes to build a 54-foot steel bell tower.

PUBLIC BUILDINGS

Sacramento, Cal.—The School Board has decided to advertise for bids for the purchase of school bonds.—Clerk of Board.

Cornelia, Ga.—Council is arranging to offer for sale $10,000 5 per cent., 30-year school bonds.—Address Clerk of the Board.

Edwardsville, Ill.—Bonds, $30,000, have been voted for high school.—Address Clerk of the Board.

Indianapolis, Ind.—The Mayor recommends the sale of $500,000 bonds to raise money for the Court House wing.—Blaine H. Miller, City Engineer.

Richmond, Ind.—The Wayne County Commissioners have under consideration issue of bonds for constructing jail.—Address County Auditor.

Lexington, Ky.—The School District has voted $75,000 4 per cent., 30-year school building bonds.—Address Clerk of the Board.

Paris, Ky.—Bids will be received, December 12, for the purchase of $45,000 5 per cent. school bonds.—O. K. McKarney, Clerk.

Coopersville, Mich.—The Ottawa County Board will receive bids, January 6, for the purchase of $15,000 5 per cent. school bonds.—F. E. Payne, Secretary.

Lake Wilson, Minn.—The citizens of School District No. 42 have voted $12,000 4 per cent. building bonds.—Address Clerk of the Board.

Monett, Mo.—An election will be held, December 21, to determine whether $60,000 bonds shall be issued for new Court House.—Address County Auditor.

Johnstown, N. Y.—Bids will be received, December 9, for the purchase of $5,000 5 per cent. city building bonds.—Joseph A. Colin, City Chamberlain.

Baldwin, N. D.—Bonds have been voted for the erection of school house.—Address Clerk of the Board.

Mingo Junction, O.—Bids will be received, December 23, for the purchase of $80,000 5 per cent. Court House bonds.—N. F. Robinson, City Clerk.

Canyon, Tex.—Randall County proposes to issue $60,000 bonds for the erection of Court House.—Address County Auditor.

Cisco, Tex.—The Attorney General has approved of an issue of $30,000 school bonds.

Groveton, Tex.—Bonds, $25,000, have been voted for erecting school building.—Address Clerk of the Board.

Panhandle, Tex.—An election will be held to decide the question of issuing $7,000 school bonds.—Address Clerk of the Board.

Tulia, Tex.—The Attorney General has authorized an issue of $15,000 5 per cent. school bonds.

Portsmouth, Va.—The School Board has petitioned Council asking that permission be secured from the Legislature to increase an issue of bonds for a school house from $30,000 to $38,000; bids for constructing annex to the Fifth District school have been rejected and new bids will be invited.

Green Bay, Wis.—The Brown County Board has authorized $50,000 bonds for building jail.—Address County Auditor.

STREET RAILWAYS

Fort Smith, Ark.—The Nelson Investment Company, capital $100,000, has organized to build an interurban electric railway from Fort Smith to West Fort Smith, about ten miles.

Duquesne, Ariz.—The Columbus-Duquesne Copper Company may build a narrow-gauge electric railway in Santa Cruz County, 25 miles long.

Long Beach, Cal.—Frank A. Crowe, Long Beach, has been granted franchises to build street car lines in Seventh street and in Pine street.

Oakland, Cal.—A franchise has geen granted to the Oakland Traction Company to operate a line along Grand avenue.

Redlands, Cal.—Local Board of Trade has taken up proposition of W. F. Whittier, of San Francisco, Cal., for the construction of an electric railway from San Jacinto Valley to Redlands; Mr. Whittier proposed to build a line to cost about $600,000, bonds for half of which he would take, and the remainder would be taken by Redlands, Hemet and San Jacinto.

Dover, Del.—The formation of a stock company to operate an electric railway in Kent and Sussex Counties is being advocated by Walter Morris, of Dover.

Pasadena, Cal.—The Pacific Electric Railway Company is taking steps to construct an electric railway from the center of Pasadena, through the northwest section, and either to La Canada or direct to Millard's Canyon.

Colorado Springs, Col.—Manitou Incline Railway Company, capitalized at $200,000, has been incorporated and has purchased from the Hydro Electric Company the cable tram road running from Manitou to the summit of Mount Manitou, one mile distant, and will rebuild line and put on new equipment. In addition it is said that the company is considering plans to build a road to the summit of Pike's Peak; the principal offices of the company are in Colorado Springs.—W. N. Brumbach, Denver, President; Chas. L. McKesson, Colorado Springs, Superintendent.

Wilmington, Del.—It is probable that a trolley line will be built between this city and West Chester, Pa.; the plans call for a road along the Concord turnpike; the new line would connect with the Wilmington City Railway at Thirty-second street and Boulevard extended.

A right-of-way through New Castle County has been practically secured for the projected electric railway of the Smyrna, Kent County and Delaware Bay Traction Company, and it is probable that construction work may be started soon; J. W. Endean is interested.

Marietta, Ga.—Preliminary surveys are to be started at once for a new electric railway to connect this place with Atlanta by way of McLand, Powder Springs, Austell and Mabelton; charter is to be applied for shortly for the company which will be known as the Marietta-McLand Railway Company, and will have capital stock of $500,000; John McEachern, Atlanta, Ga., and W. J. Manning, Marietta, are interested.

Danville, Ill.—The Danville Merchants' Association has appointed a committee to cooperate with the Indiana citizens, including business organizations of Terra Haute, Ind., in the promotion of an interurban road between Terre Haute and Danville.

Streator, Ill.—Council has unanimously adopted the new interurban ordinance, granting the Chicago, Ottawa and Peoria Railway Company a franchise to construct and operate an interurban line in this city.

Clinton, Ia.—The interurban project between Clinton and Dubuque, which will complete a system of interurban lines from Davenport to Dubuque, is now practically an assured thing; the survey has been thoroughly gone over, there being three proposed routes between this city and Dubuque; the line will run by way of Maquoketa and Cascade, and will be about 80 miles in length; it is also stated that the new line will be a third rail system and that it will be finished in about two years; it will take about $2,500,000 to construct the road.—T. J. Wilcox, Promoter.

Ness City, Kan.—Ness County bonds, $435,000, have been voted for railroad purposes.—Address County Auditor.

Babylon, L. I., N. Y.—The Village Trustees have granted franchise to South Shore Traction Company for a trolley line on Cooper and James streets, and Deer Park avenue; the South Shore Company is to build and operate a line from Brookhaven west to Blackwell's Island Bridge, Brooklyn.

Larchmont, N. Y.—New York and Stamford Railway Company has been granted permission to double-track its lines in Larchmont, Rye and Portchester; company operates an electric railway from New Rochelle, N. Y., to the Connecticut State line, where it connects with an electric railway extending to Stamford, Conn.; the double-tracking in the above towns is said to be the first step toward double-tracking entire system.

Chimney Rock, N. C.—An election will be held, December 9, to decide the question of issuing $10,000 in bonds to aid railroad.

Greenhill, N. C.—An election will be held, December 9, to vote on issue of $10,000 bonds to aid interurban railroad.—Address Clerk of the Board.

Defiance, O.—The Defiance, Paulding and Fort Wayne Traction Company, of Fort Wayne, Ind., has secured a portion of the right of way for its proposed line from Defiance, O., to Fort Wayne, Ind.—K. V. Haymaker, of Defiance, is one of the chief promoters.

Lima, O.—W. Kelsey Schoepf has bought for cash a 25-year extension in the present street railway franchises here, paying the referee the sum of $115,000.

Ardmore, Okla.—The Ardmore Light and Power Company has sold its street railway franchise and track laid to D. Fitzgerald, of New York City, for $25,000; Fitzgerald is planning to have cars running and three or four additional miles of track by June 28; he also agrees to spend at least $5,000 in improving the property within the next sixty days

Oklahoma City, Okla.—A charter has been granted to the Oklahoma Interurban Traction Company, of Oklahoma City, $500,000 capital stock, to build an electric interurban line in Oklahoma City and Capitol Hill, and to El Reno; the incorporators are: L. E. Patterson, S. C. Glasgow, G. F. Benz, John H. Wright and Lee Hamilton.

Wilkes-Barre, Pa.—Wilkes-Barre and West Side Railway Company has been granted permission to build a branch to electric railway beginning at Main street and Courtdale avenue, in Luzerne Borough and continuing through Courtdale.

Bluefield, W. Va.—The Bluestone Traction Company has been granted a franchise to build lines on South Bland street and other thoroughfares in South Bluefield.

Brantford, Ont., Can.—By the terms of a new franchise the local street railway company must lay between six or seven miles of new lines within two years.

BRIDGES

Colona, Ill.—Colona has been chosen for site for bridge across the Rock River and the construction of a bridge next summer is practically assured; the Rock Island County Supervisors and the Henry County Supervisors will co-operate; estimated cost, $26,000.

Joliet, Ill.—The Will County Board will petition for an appropriation of $10,000, to have the bridges over the canal at Troy and Channahon rebuilt.

Lafayette, Ind.—Bids are to be asked shortly by the Commissioners of Tippecanoe County for the construction of a new steel bridge over the Wabash River at Granville; the structure will be 645 feet long and consist of three spans of 215 feet each; the roadway is to be 16 feet wide, two concrete abutments and two stone piers.

Cambridge, Mass.—The Committee on Highways has recommended an appropriation of $10,000 for rebuilding the First street bridge.

St. Louis, Mo.—The free bridge bill has been passed over the veto of Mayor Wells.

Toledo, O.—The Board of Public Service has approved plans for construction of Lake Shore and Michigan Southern Railway bridge over Swan Creek from Monroe street to Goose Point; bridge will cost about $85,000 and will be of Scherzer rolling lift type; work on driving piles will begin immediately and the superstructure started in the spring. —B. R. Leffler, Cleveland, Engineer of Bridges, L. S. & M. S.

The Board of Public Service has recommended that Cherry street bridge be improved at a cost of about $23,000.

Troy, O.—The County Engineer has been instructed to prepare estimates for proposed canal bridges at Troy and Piqua.

Portland, Ore.—Plans will be prepared by the Engineer of the Portland Light and Power Company for the construction of the Hawthorne bridge across the Willamette River, to replace the structure known as the Madison street bridge.—B. J. Josselyn, President.

Plans are going forward under the direction of Harriman engineers for the construction of a new bridge across the Willamette in North Portland, to take the place of the present steel bridge; work will not be commenced until next year and the old bridge will be replaced with a new and modern construction.

Allegheny, Pa.—Mayor Chas. F. Kirshler recommends the erection of two bridges.

Fosterville, Pa.—An overhead bridge over the Pennsylvania Southwest tracks at Fosterville will be built by the Pennsylvania as a result of a favorable report of the Board of Viewers, W. H. Matthews, S. O. Lowry and W. C. Loor, appointed by the Court; it is said that the Pennsylvania will spend $75,000 in building a viaduct that will eliminate the dangerous grade crossing over the numerous tracks at Fosterville.

Jenkintown, Pa.—The Noble bridge on the old York road north of Jenkintown will be replaced by a concrete and steel bridge, 60 feet wide; estimated cost, about $15,000.

Philadelphia, Pa.—George R. Stearns, Director, Department Public Works, has recommended the construction of a number of new bridges.

Washington, Pa.—The bridge over Monongahela River at Monongahela will be erected by Washington and Allegheny Counties and will cost $294,228; Wm. Wylie, County Engineer. Bridge over Mingo Creek, in Nottingham Township, will be built and the Good Intent bridge in West Finley Township rebuilt.

Beaumont, Tex.—County Judge J. A. Harrison and J. C. Chaney, Commissioner from Precinct No. 1, have been designated as a committee from the Hardin County Commissioner's Court to consider the matter of building a $1,500 bridge over Pine Island Bayou at Yoth, to replace the one destroyed by the high water last summer.

Houston, Tex.—The City Engineer estimates damage to bridges by storm at $5,000.

Mineral Wells, Tex.—The Attorney General has authorized an issue of $1,196 bridge improvement bonds.

Mount Vernon, Wash.—John W. Meehan, County Engineer, has been authorized to secure plans and specifications for the construction of a 252-foot steel span, 20 feet in width in the clear, for the Mount Vernon bridge.—Waddell & Hedrick, New Nelson Building, Kansas City, Mo., Consulting Engineers.

Moundsville, W. Va.—Panama Coal Mining Company has purchased Glen Easton Coal Company's property and will make improvements to plant; will construct railroad bridge, concrete piers and steel girders; will install electrical mining machinery and mine cars.

Wheeling, W. Va.—Council has decided to issue $25,000 in bonds for Market street bridge.

Lake Mills, Wis.—The County Board has appropriated $7,000 and the town of Milford has raised $7,000 for constructing a new bridge over the Crawfish River, to take the place of Hubbleton bridge.

Milwaukee, Wis.—Alderman Grass has introduced a resolution in Council empowering the Board of Public Works to let contracts for a bascule bridge over the Kinnickinnic River at Kinnickinnic avenue.

Racine, Wis.—A new approach is to be built at the west end of Kinzie avenue bridge.

MISCELLANEOUS

Oakland, Cal.—A resolution has been passed authorizing the Board of Public Works to purchase for the use of the Board of Health an automobile and appropriating $1,500 therefor.

A resolution has been passed authorizing the Board of Public Works to employ an engineer to carry out the ideas of the Wharves and Water Front Committee at an expense not to exceed $5,000.

San Buena Ventura, Cal.—Bids will be received, December 9, for the purchase of $69,000 municipal improvement bonds, interest 5 per cent.—Edwin Isensee, City Clerk, Ventura, P. O.

San Diego, Cal.—H. L. Emerson, Denver, Col., has made a proposition to the Board of Health to install a garbage crematory and look after the collection of garbage; estimated cost of installing plant, $25,000.

San Francisco, Cal.—Specifications and estimates for the free public market on the city front are being prepared, and bids will be advertised for construction; the floors will be of concrete, walls covered with iron, and the roof of fireproof composition.

Plans of the engineer for a large lumber wharf in Central Basin have been approved, and the Board has called for bids for construction of the wharf, at a cost of $70,000.

Washington, D. C.—Among the estimates for local improvements to be submitted to Congress at its coming session by the Secretary of War is one of $770,000 for additional buildings for the engineer post and school at the Washington Barracks' Reservation, as follows: A building or buildings for post headquarters, engineer school, engineer library, engineer museum, etc., $350,000; barrack No. 2 (completing), $35,000; six additional double sets of quarters for non-commissioned officers' quarters, $60,000; new post hospital, $60,000; bachelor officers' quarters, $65,000; one new stable, $17,500; engineer school power house, $20,000; engineer school trade shops, $20,000; quartermaster's coal shed, $8,000; timber shed, $3,000; quarters for chaplain, $17,000; extending and completing the system of roads, sidewalks, sewers, water supply, gas and electrical distribution to serve these new buildings, $25,000; field observatory, $3,000; contingencies, $71,600. In addition, there is urgently required a storage shed for ponton wagons, which is estimated to cost $12,500.

Augusta, Ga.—Inspector Burson, of the United States Department of Agriculture, has condemned the abattoir at this place, and it is positively stated one of ample dimensions will be established here, probably under the municipal government.

Barnesville, Ga.—The city has appropriated $4,000 for improving the water and electric system.

An election will be held, December 31, to vote on the question of issuing $45,000 improvement bonds.

Peoria, Ill.—An ordinance is before Council requiring the Western Union Telegraph Company to place its wires underground.

Murray, Ky.—Bids will be received, at any time, for $20,000 4 per cent., 5-20-year water and light bonds.—M. D. Wear, City Clerk.

Minneapolis, Minn.—Bids will be received, December 31, for the purchase of $441,000 school bonds and $100,000 park bonds; the bonds bear interest at the rate of 4 per cent.—Dan C. Brown, City Comptroller.

Dan C. Brown, City Comptroller, has been directed to advertise for bids for bonds in any sum from $50 to $240,000; the sale to be open until December 31.

Joplin, Mo.—Sewer and viaduct bond ordinances are under consideration of Council.

St. Louis, Mo.—The Board of Public Improvements will advertise for bids on the garbage contract; the ordinance authorizing the Board to let the contract, which was passed some time ago by the Municipal Assembly, provides that the contractor willing to pay the largest sum be awarded contract for disposing of the garbage; if none offers to pay for the privilege, the lowest bidder is to get the contract; the bids may range from a proposition to pay the city $30,000 a year to a proposition to dispose of the garbage for $100,000 a year.

Syracuse, N. Y.—Four pneumatic pressure street flushing wagons are to be purchased by the Department of Public Works; estimated cost, $1,000 each.

Lenoir, N. C.—Bids will be received, December 15, for the purchase of $100,000 water and light bonds, interest 6 per cent.—J. C. Seagle, Treasurer.

Grand Forks, N. D.—Council will receive bids, December 10, for the purchase of city bonds.

Columbus, O.—Trustees of the Ohio Soldiers' and Sailors' Orphans' Home at Xenia have asked for a special appropriation of $100,000 to install a complete new power plant and sewerage system.

Massillon, O.—Council will probably order the 500 street crossings of the city supplied with enameled street signs of good size and readable at a distance of 50 feet, at a cost of $2,000.

Warren, O.—Bids will be received, December 18, for $18,000 5 per cent. improvement bonds.—Address County Surveyor.

Enid, Okla.—Bids will be received, December 19, for $285,000 20-year sanitary sewer bonds, $55,000 20-year refunding bonds, $25,000 30-year Fire Department bonds, $15,000 30-year water extension bonds, $10,000 20-year septic sewer bonds, interest 5 per cent.—E. R. Lee, City Clerk.

Bradford, Pa.—An ordinance has been introduced authorizing the issue of bonds for $71,300 for municipal improvements.

Juniata, Pa.—The citizens have voted $15,000 5 per cent. sewer and water bonds.

Providence, R. I.—Bids will be advertised immediately for the collection of garbage.

Mineral Wells, Tex.—Bonds, $25,000, have been voted for water works and sewers.

Murray, Tex.—Council offers for sale $20,000 4 per cent. water and light bonds.—M. B. Wear, City Clerk.

Alexandria, Va.—Members of Council are considering the purchase of a police patrol wagon, as the city is without one.

Olympia, Wash.—Plans are being formulated for the construction of a garbage disposal works.

Tacoma, Wash.—Commissioner of Public Works Owen Woods has asked Council to take favorable action on the proposition of appropriating $10,000 a year for four years for a plant which will dispose of forty tons of garbage a day.

Wheeling, W. Va.—Council has decided to issue $935,000 bonds, divided as follows: Water works, $500,000; crematory, $35,000; gas works, $150,000; sewers and paving, $225,000, and Market street bridge, $25,000.

Madison, Wis.—There were 53 bidders on contracts for building and equipping heating and storage plant in new Capitol building, by Col. U. F. Vilas, of Executive Committee of the Capitol Building Commission; the plant represents an investment of about $500,000; the bids will be examined and tabulated before contracts are awarded.—Lew F. Porter, Secretary of Commission.

Prairie du Chien, Wis.—Chicago, Milwaukee and St. Paul Railroad officials are planning some improvements for this city in the very near future, which will probably include shops, a high bridge and division headquarters.

Rock Springs, Wyo.—The Eden Irrigation Company is planning to irrigate 30,000 acres of land; the main canal will be 11 miles long, and 22 feet wide.—W. C. De Celle, Manager.

Edmonton, Alta., Can.—Extensions to the sewer and water works systems are contemplated, $96,000 having been voted for these improvements.—R. R. Keelv, City Engineer.

Ottawa, Can.—The Board of Health has decided to recommend to the City Council that $25,000 be raised by debentures for the erection of a public abattoir; the establishment of such an institution has been actively urged by the Humane Society.

BIDS RECEIVED

Oakland, Cal.—Bids on the East Side sewer extension from East Eleventh street to East Eighth street have been opened by the Board of Works; C. D. Vincent submitted the lowest tender, his figure being about $8,800; F. H. Dahnke, Burrell Bridge and Construction Company Contra Costa Construction Company, and Stanley Construction Company all submitted bids.

Ft. Dupont, Del.—The following bids were received, on November 25, by Capt. J. L. Knowlton, Constructing Quartermaster, Ft. Dupont, for remodeling (a) the sewer system and (b) installing two sewage ejectors and ejector chamber: Joseph Anderson, Delaware City, (a) $4,924; Harry A. Miller, Wilmington, Del., (a) $7,780, (b) $7,195; M. B. Bunyea, Chester, Pa., (a) $7,300, (b) $7,900.

Wilmington, Del.—The Aimes Asphalt Company has been awarded contract to construct macadam road between Wilmington

and New Castle road, to be 14 feet wide and 8 inches thick, with the end of the road to be resurfaced with 4 inches of stone, for $20,498.08; other bidders were: Dawson & Davis, Devon, Pa., $23,203.80; S. F. Wickersham, Kennett Square, Pa., $24,500; F. W. Bourneman, Lansdowne, Pa., $20,578.40.—Francis A. Price, New Castle County, State Highway Commissioner.

Washington, D. C.—Bids were received as follows, on November 25, by the Commissioner of the District of Columbia, for the construction of sewers: (a) W. F. Brenizer Company, Washington, D. C.; (b) R. J. Beall Construction Company, Washington, D. C.; (c) E. G. Gummel, Washington, D. C.: Ordinary excavation, (a) 62 cents, (b) 85 cents, (c) 70 cents; sewer brick masonry, (a) $14, (b) $18, (c) $15; vitrified brick masonry, (a) $21.50, (b) $24, (c) $21; concrete masonry "B," (a) $8.75, (b) $10.50, (c) $8; concrete masonry "C," (a) $9.10, (b) $10, (c) $8.

Atlanta, Ga.—Cook & Laurie, of Montgomery, J. H. Cook, President, have been awarded contract for constructing the Atlanta-Augusta interurban electric line, and orders for the equipment for the portion of the line to Atlanta will be placed immediately.

Montgomery, Ga.—The contract for the construction of the Atlanta-Augusta interurban electric line has been awarded to the Cook & Laurie Company, of Montgomery, Ala., and orders for the equipment of the line, beginning from the Atlanta end, will be placed immediately.

Quincy, Ill.—Two firms have quoted prices on fire engines, the Ahrens Company, of Cincinnati, O., quoting prices of $5,750 on a first-class engine, $5,500 on a second-class engine and $5,250 on a third-class engine; the first will throw 900 gallons of water a minute, the second 700 and the third 600 a minute. The American La France Fire Engine Company, of Chicago, submitted prices ranging from $5,000 to $5,350.

Springfield, Ill.—Richard F. Egan has been awarded contract for constructing sewer in North Grand avenue, from First street to West Grand avenue, at 90 cents per foot for 18-inch pipe sewer, 50 cents per foot for 12-inch, 40 cents per foot for 12-inch inlets and manholes $25 each.

Gary, Ind.—The Co-operative Construction Company, 77 Monroe street, Chicago, Ill., has the contract to construct the Gary and Interurban Railway.

New Orleans, La.—Following are the bids received by the Finance Committee, November 11, for erecting an annex to the City Hall: Jefferson Construction Company, North Peters and Louisa street, New Orleans, $286,000 and $5,000 additional for a passenger elevator (recommended for award); and W. T. Carey & Brother, 1226 Carrollton avenue, New Orleans, $276,000 and $5,000 additional for a passenger elevator.

Portland, Me.—Council has authorized the renewal for five years of the city's contract with the Portland Electric Light and Power Company.

Grand Rapids, Mich.—The contract for the Silver Creek revetment wall has been awarded to Thomas Newhof, for $1,694.

Contract for paving of the Ann street bridge has been awarded to the Wyckoff, White Creosote Company, of Stamford, Conn., whose bid was the lowest, $4,728.

Luverne, Minn.—The City Council, on November 5, awarded the contract for the construction of sewers to Greene & Delate, at 65 cents per lineal foot for sewer; manholes, each, $60; and flush tanks, each, $90.

Newton, Miss.—The Arnes & Ott Manufacturing Company, of New Orleans, will build a water system at this place, estimated to cost $40,000.

Paterson, N. J.—Bids have been received for repairing the retaining wall on Oxford street, near the Bamford mill, and the contract was awarded to William H. Baily, the lowest bidder, for $365.

Perth Amboy, N. J.—Two bids have been received for removing the abandoned 16-inch main in the Raritan river. John H. Gregory agreed to remove the 166 lengths of 16-inch pipe, now lying between Marsh Point and Perth Amboy, for $19 per length, and he agreed to purchase the pipe for $500. The Merritt Wrecking Company agreed to remove it for $10.80 per length, but submitted no bid for purchasing the pipe; the Board decided to readvertise for bids.

Trenton, N. J.—Estimates have been approved: Antonio De Lucia, sewer No. 384, in Parkside avenue, $629.72; James W. Kernan, sewer No. 394, in Colonial avenue; Thomas J. McGovern, sewer No. 390, in Stuyvesant avenue, $808.56; Gibbs & Morgan, sewer No. 386, in Franklin and Liberty streets, $1,086.96; Peter H. Dolan, grading the Dean tract, $415.60.

Woodbury, N. J.—The following bids were received, November 25, by John E. Estell for paving South Broad street; 2,950 square yards Warren's bitulithic pavement: Standard Bitulithic Company, New York, $2.25 per square yard; Columbia Paving Company, Geneva, N. Y., $2.45 per square yard.

West Orange, N. J.—All bids received for the removal of garbage and ashes from the town were rejected, and new bids will be received by the Town Council, December 17; Charles Hamilton was low bidder for depositing it east of the mountain by $392.60, while Street Commissioner Frank G. Eckert was lower than Hamilton for west of the mountain by $7.40; under the readvertisement all dumping must be done on the west side of the mountain.

Rochester, N. Y.—Tabulation of the bids recently received for various highways in the State, including seven in Monroe county, has been completed by State Engineer Frank Skene, and the figures were made public recently; the contracts will be awarded, it is understood, within a few days, except for a road in Orange county, the bids for which vary so widely that the State Engineer desires to make inquiries before awarding the contract. The roads in Monroe county for which bids were invited, and the bidders, with the number of the contract, are as follows: No. 398, Orleans-Monroe county line road: Low bidder, Stewart-Kerbaugh-Shanley Company, New York, $30,342; the other bidder was the Greece Construction Company, Rochester, $30,809. No. 401, Rapids road: Low bidder, Whitmore, Rauber & Vicinus, Rochester, $27,170; the other bidder was Jeremiah T. Finch, Troy, $32,586.90. No. 402, Buffalo road, section No. 3: Low bidder, Greece Construction Company, Rochester, $24,805.65; other bidders were Gantz-Wilson Construction Company, Buffalo, $29,796.60; Chambers & Grady, Rochester, $30,274. No. 403, Churchville-Riga road: Low bidder, Patrick A. Lillis, Troy, $17,412; other bidders were Greece Construction Company, $17,551; Chambers & Grady, Rochester, $20,030. No. 408, Rich's Dugway-Penfield road: Patrick A. Lillis, Troy, $23,790; the other bidders were Monroe Roads Company, $24,398.20; Whitmore, Rauber & Vicinus, $27,179.05. No. 474, Clover street, section No. 2: Low bidder, Patrick A. Lillis, Troy, $12,695; the other bidders were Monroe Roads Company, $14,735; Whitmore, Rauber & Vicinus, $16,034.90. No. 479, Fairport, section No. 2: Patrick A. Lillis, Troy, $3,376; the other bidders were Monroe Roads Company, $3,391.70; Whitmore, Rauber & Vicinus, $3,434.50. Rochester contractors were the lowest bidders on contracts in other counties, as follows: No. 273, Seneca River road, north side of river, Seneca county: Chambers & Grady, $14,886. No. 358, Horseheads-Corning road, Chemung county: Casey & Murray, $77,954. No. 391, Clarendon-Holley, section No. 1, Orleans county: Greece Construction Company, $25,136. No. 421, Conklin road, Broome county: Casey & Murray, $58,766. No. 462, Old Forge-McKeever road, Herkimer county: Casey & Murray, $70,664. The work under these contracts, when awarded, will not be begun until after the frost is out of the ground next spring. The engineers in charge say it is so late in the season that no more than a beginning could be made this fall, and that the resulting torn-up condition of the roads would make every thoroughfare in process of improvement impassable for many weeks during the spring.

Syracuse, N. Y.—A contract for laying an asphalt pavement on Court street, from North Salina street to Third North street has been awarded to F. J. Baker, at $40,445.92, by the Board of Contract and Supply. Contract for paving, with asphalt, Grape street, from East Kennedy street to its southern terminus, and Oakwood avenue, from the south terminus of Grape street to Renwick avenue, was made to the Central City Paving Company, for $8,620.30; Samuel Bonn was given contract for paving Solar street, from Plum street to the railroad switch at the E. I. Rice coal yards, at $4,000.20, for which Syracuse block was designated as the material by the property owners. Owing to a defect in bids for the McCarthy alley paving contract the Board for a second time rejected all proposals. Bids will be readvertised for.

Sidewalk contracts awarded by the Board were as follows: West side of First avenue, from Park street to Farmer street, Hill & Van Wagner, at 13 cents a square foot. South side of Emma street, from Midland avenue to Devoe tract, Albert Gaffey, at 12½ cents a square foot. East side of Walnut avenue, from Madison street to East Genesee street, west side of Walnut avenue from East Genesee street to Ashworth place, and both sides from Ashworth place to East Water street, the Salt City Paving Company, at 11 94-100 cents a square foot. Awards made on bids received three weeks ago for sidewalk construction included the west side of Milton avenue from Lewis street to Essex street, and the east side of Rice and Hopper street, to the Artificial Paving Company. A walk on the east side of Wilson street from Shuart avenue to James street will be built by the Salt City Paving Company.

Bids on the paving of Salt street from Butternut street to North Salina street, and Laurel street from Salt street to North Salina street were received as follows: Asphalt: Warner-Quinlan Asphalt Paving Company, $4,203; Guy B. Dickinson, Trinidad, $3,848.50. Brick or block: Samuel Bonn, brick, $3,955.90; Samuel Bonn, Syracuse block, $3,776.30; Nicholas Marnell, Syracuse brick or block, $3,889.10; Warner-Quinlan Asphalt Company, Johnsonburg block, $4,254; Guy B. Dickinson, Johnsonburg block, $3,821. For the paving of Columbus avenue from East Genesee street to Lexington avenue bids were opened as follows: Asphalt in center and grooved brick or sandstone block on the sides, Guy B. Dickinson, Trinidad and Johnsonburg, vitrified grooved brick in tracks and vitrified grooved brick pavement, $2,861.65; sandstone in tracks, vitrified grooved brick pavement, $2,901.65; vitrified grooved brick in tracks, sandstone block pavement, $3,270.15; sandstone in tracks, sandstone block pavements, $3,310.15. Warner-Quinlan Asphalt Company, Trinidad and Johnsonburg, vitrified grooved brick in tracks and vitrified grooved brick pavement, $2,961.85; sandstone in tracks and vitrified grooved brick pavement, $2,999.35; vitrified grooved brick in tracks, sandstone block pavement, $3,327.35; sandstone in tracks, sandstone block pavement, $3,364.85.

With his bid of $1,012.30, John W. Davin, Jr., was low on a 12-inch pipe sewer that is to be constructed in Cambridge street. Mr. Davin will also be awarded a contract for construction of a 12-inch pipe sewer in Lodi street from Catawba street to Pond street. His bid was low at $741. Samuel Bonn was low bidder on a 12-inch sewer to be built in Maple street from East Genesee street to Madison street, and in Madison street from Maple street to Cherry street. His proposal for the work was $1,623.75. A 12-inch sewer in Madison street from Comstock avenue to Walnut avenue will be built by Alexander Barr, whose bid of $611.10 was the lowest filed.

Syracuse, N. Y.—State Engineer Frederick Skene will not for some days award a contract for improvement of the Tully road, in this county, for which the Stewart, Kerbaugh, Shanley Company, of New York, is the low bidder, at $36,369, his reason for delay being that he wishes to investigate the cause of the difference between the bids of the contractors. It was stated at Albany that the variance was extraordinary. Other similar contracts will be delayed.

Chillicothe, O.—Wm. Ringwald has the contract for paving the alleys at the Warren House and Deshler road with concrete, at $3,800.

Hamilton, O.—The Massilon Steel and Iron Company has been awarded the contract for 6-inch sewer pipe, at $32 per ton, and for 4-inch sewer pipe, at $32.70 per ton.

Middletown, O.—J. B. Meehan has the contract for constructing cement sidewalks, curbs and gutters, at $2,900.

Springfield, O.—The McCracken Company of Columbus appears to be low bidder for the new high level sewer; specifications call for a 24, 30 and 33-inch structure.

Youngstown, O.—Bids for the construction of sewers in Ridge and Fairview avenues and Regent streets have been opened by the Board of Public Service. There was a large number of bidders for both contracts, and all bids were remarkably low. Sherman DeGroodt had the low bids for Ridge avenue, $297.50, and Regent street, $824.60; Anthony O'Horo was the low bidder on the Fairview avenue contract, his bid being $297.50; for this contract DeGroodt bid $1,054, which was the highest bid obtained.

Springfield, O.—Bids for the construction of the high level intercepter sanitary sewer have been submitted as follows: Huonker & Williams—2,096 feet 24-inch concrete, $2.70 per foot; 5,554 feet 30-inch concrete, $3.50 per foot; 2,166 feet 33-inch concrete, $3.60 per foot; 24-inch reinforced concrete, $2.85 per foot; 30-inch reinforced concrete, $3.70 per foot; 33-inch reinforced concrete, $3.85 per foot; 9,376 feet 6-inch pipe, 95 cents per foot; 800 feet 8-inch pipe, $1; 50 feet 18-inch pipe, $1.60; 2,096 feet 24-inch pipe, $2.65 per foot; 5,564 feet 30-inch pipe, $4.20 per foot; 2,166 feet 33-inch pipe, $4.70 per foot; 6-inch "Y" on 24-inch pipe, $7.40; 6-inch "Y" on 30-inch pipe, $13.55; 6-inch "Y" on 33-inch pipe, $15.95; 6-inch slants, $50; round manholes, $50; single manholes, $60; class "A" concrete, $7; class "B" concrete, $6; "Y" branches, $1; double drop manholes, $100; regulator, $600.

C. I. McCracken Company, Columbus—Six-inch pipe, $1; 8-inch pipe, $1; 18-inch pipe, $2.50; 24-inch pipe, $2.47; 30-inch pipe, $3.64; 33-inch pipe, $467; 6-inch "Y" on 24-inch pipe, $5; 6-inch "Y" on 30-inch pipe, $1,270; 6-inch "Y" on 23-inch pipe, $14; 6-inch slants, $50;

manholes, round, $40; single drop manholes, $60; class "A" concrete, $10; class "B" concrete, $6; "Y" branches, $4; double drop manholes, $100; regulator, $600.

C. M. Long—24-inch concrete, $170 per foot; 30-inch concrete, $2.50; 33-inch concrete, $2.65; 24-inch reinforced concrete, $1.80; 30-inch reinforced concrete, $2.55; 33-inch reinforced concrete, $2.65; 6-inch pipe, 24 cents; 8-inch pipe, 28 cents; 18-inch pipe, $1.67; 30-inch pipe, $2.87; 33-inch pipe, $3.16; 6-inch "Y" on 24-inch pipe, $5; 6-inch on 30-inch pipe, $10.60; 6-inch "Y" on 33-inch pipe, $12.85; 6-inch slants, 30 cents; round manholes, $37 each; single drop manholes, $45 each; class "A" concrete, $5; class "B" concrete, $4.60; "Y" branches, $14; double drop manholes, $50; regulator, $45.

The totals as prepared by Engineer W. H. Sieverling are as follows: Huonker & Williams, plain concrete, $46,604.50, with rock excavation, $2,354.50; reinforced concrete, $48,571.20, with rock excavation, $84,321.20; vitrified pipe, $56,352.70, with rock excavation, $92,102.70; 24-inch pipe and concrete, $46,989.60, with rock excavation, $82,739.60; 24-inch pipe and reinforced concrete, $48,641.90, with rock excavation, $84,391.90.

C. I. McCracken Company, of Columbus: Vitrified pipe, $52,933.90, with rock excavation, $88,683.90.

C. M. Long: Plain concrete, $28,682.24, with rock excavation, $64,432.24; reinforced concrete, $29,169.54, with rock excavation, $64,919.54; vitrified pipe, $34,572, with rock excavation, $70,322; vitrified pipe and concrete, $28,953, with rock excavation, vitrified pipe and reinforced concrete, $29,230.76, with rock excavation, $64,980.76.

The approximate cost of the sewer is $97,373; the probable cost of rock excavation being $35,750; making the total estimate for the sewer work, $61,623.

Zanesville, O.—Contractors Petit & Able are low bidders for paving Fineley avenue, at their bid of $3,100; and J. S. Woodrow is low on Culbertson street, at $6,500.

Lawton, Okla.—Contracts have been perfected between the city and the American Light and Power Company, of Kansas City, Mo., and the McQuatters Plumbing and Machine Company, of Hillsboro, Tex., whereby the former company purchases $200,000 water works bonds and the latter company agrees to construct the system; the city receives par value for the bonds, and in turn Lawton pays $175,000 for a pipe line from the city to Medicine Creek, near Mount Scott, a distance of twelve miles; the work is to be completed within a year's time; this system is in addition to the present plant.

Portland, Ore.—Robert Wakefield was low bidder for constructing new steel bridge in Union avenue over Sullivan's Gulch, at $73,173; the International Construction Company, Seattle, Wash., bid $74,530, and the Indianapolis Machine Company, $74,985; the City Engineer and Bridge Committee of Council will make recommendation to the City Executive Board as to awarding of contract.

Harrisburg, Pa.—The Kellar-Pike Company, of Philadelphia, has been awarded contract for making the alterations necessary at the Capitol, by which all the electrical illumination on the Hill, including lights in Capitol Park, the State Library and Museum, and the greenhouses, will be done at the State's power plant in the basement of the building, and a saving of $1,097 per month made on the amount now paid the Light, Heat and Power Company for this lighting; the Kellar-Pike Company bid $13,197 for the work; there were five other bidders, including the Dauphin Electrical Supply Company, of Harrisburg, the only local bidder, at $24,028.

Dallas, Tex.—Bids for laying a 6-inch sanitary sewer in the territory bounded by Thomas and State, Hall and Central avenues were made as follows: George R. Ennison, $276.85; Dallas Home Improvement Company, $259.90; C. W. Olcott, $248.60. The contract was awarded to C. W. Olcott, as the lowest and best bidder.

Bids for lithographing the three proposed issues of city bonds have been received. The bid of M. P. Exline Company to prepare lithographed bonds for each of the three issues at $425, being the lowest and best bid, was accepted. For a steel engraved bond, the United States Mortgage and Trust Company, $1,265; Western Bank Note Company, $1,500. The latter company filed a bid to prepare said bonds with a steel engraved border and lithographed bond at $300, but said bid being based on 650 bonds, without any changes throughout, could not be considered. For preparing said bonds with lithographed border and printed body, the bid of Sam Hargreaves Printing Company was $400 and J. W. Middleton & Co., $275. For a full lithographed bond the following bids were received: Dorsey Printing Company, $800; J. W. Middleton & Co., $630; M. P. Exline Company, $425.

Proposals

BASCULE BRIDGE

New Orleans, La., Nov. 21, 1907.

Pursuant to ordinance No. 4551 and 4832 N.C.S., sealed proposals will be received at the office of the Comptroller in the City of New Orleans, until the hour of 1 p. m. Thursday, January 2, 1908, for the erection of a bascule trunnion bridge over the Bayou St. John, at the intersection of Esplanade avenue, in accordance with plans and specifications on file in the office of the City Engineer. Deposit $1,500 with the City Treasurer, and his receipt enclosed with bid, or certified check for said amount. Bond in an amount equal to twenty-five (25) per cent. of the contract price.

The City Engineer will furnish bidders with a blank form of proposal; no proposal will be considered unless submitted on such form. Bidders must have paid their city license in order that their bid may be accepted.

The city reserves the right to reject any and all bids.

CHARLES R. KENNEDY,
(23-26) Comptroller.

STREET PAVING

Billings, Mont., November 7, 1907.

Sealed proposals for the paving with shale brick of certain streets of the City of Billings, Montana, described in the resolution creating Special Improvement District No. 21, will be received by the City Council up to 8 o'clock p. m. of February 4, 1908, addressed to the undersigned, and endorsed: "Proposals for Paving."

The work for which proposals are invited consists of, approximately, 6,305 square yards of shale brick pavement, the foundation for which is otherwise provided for.

Each proposal must be accompanied by a certified check for $1,000 on some responsible bank in the City of Billings, and made payable to said city. The successful bidder must enter into an undertaking in the sum of $2,000, with approved sureties. Plans and specifications are on file in this office.

The right is reserved to reject any and all bids.

J. D. MATHESON,
City Clerk.

PAVING

Salt Lake City, Utah, Oct. 12, 1907.

Sealed proposals will be received at this office until 8 o'clock p. m. Friday, December 6, 1907, for the work of grading, curbing and paving First South street from Second East street to Thirteenth East street.

The approximate quantities of work to be done are as follows:

Grading—60,000 cubic yards.

Curbing—17,000 linear feet.

Asphalt pavement—41,000 square yards.

Instructions to bidders, together with specifications and forms for contract and bonds, can be obtained upon application at the office of the Board of Public Works or City Engineer.

The right is reserved to reject any and all bids.

By order of the Board of Public Works.
F. J. LEONARD,
Chairman.
LOUIS C. KELSEY,
City Engineer.

GARBAGE REDUCTION WORKS

Columbus, O.

Sealed proposals for the construction of garbage reduction works will be received by the Board of Public Service, Columbus, Ohio, at 12 o'clock noon (standard time) of January 14, 1908, in accordance with specifications on file in the office of said Board and in the custody of Henry Maetzel, Chief Engineer, Department of Public Service. The work consists of the design, construction, delivery and erection of the reduction works complete, on land owned by the City of Columbus. The works will have a capacity of 100 tons per 24 hours. Each proposal must be accompanied by a proposal bond or certified check for an amount equal to at least 10 per cent. of the bid. A bond for 50 per cent. of the amount of the contract will be required of the successful bidder. Copies of the specifications may be obtained from, and a plan showing the location of the proposed works may be seen at the office of the Chief Engineer.

By order of the Board of Public Service.
E. F. McGUIRE,
Secretary.

FILTER PLANT

Cambridge Springs, Pa., Nov. 5, 1907.

Sealed proposals, addressed to A. H. Drake, Borough Clerk, Cambridge Springs, Pa., and endorsed "Proposals for Filter Plant," will be received at the office of A. H. Drake, Borough Clerk, until 7:30 o'clock p. m. Thursday, December 12, 1907, and then publicly opened, for the construction of a mechanical filter plant for the Borough of Cambridge Springs, Pa.

Information for bidders, plans and specifications may be seen at the office of the Borough Clerk.

The borough reserves the right to reject any or all bids.

J. F. HIMEBAUGH,
Burgess.

BIDS FOR BRIDGE

Wilmington, N. C.

The counties of New Hanover and Pender invite bids for a steel highway bridge approximating 400 feet, including draw span, over North East River at Castle Haynes, N. C. Bids are to include foundations; depth of water, about 32 feet. Bridge to have 16-foot road clearance, and to carry 15-ton road roller. Design of bridge and details to be submitted by the bidders. Commissioners reserve right to reject any and all bids. Bidders must take their own measurements and soundings. Bids will be opened Tuesday, January 7, 1908, at 3 o'clock p. m.

For further information apply to

D. McEACHERN, Chairman,
Wilmington, N. C.

WANTS

CIVIL ENGINEER—University graduate, with three years' experience in railway, municipal, reinforced concrete and cofferdam construction. Address "Z. A. 11," Municipal Journal and Engineer, New York.

MUNICIPAL engineers, experts, chemists wanted for positions in all parts of the world; also openings for sales and technical men; write to-day. Hapgoods, 305 Broadway, New York; or 1010 Hartford Bldg., Chicago.

WANTED—Position on survey corps or with civil engineer, by young man 18 years old, who has been studying civil engineering one year.—Address No. 425, Municipal Journal and Engineer.

Civil Service Examinations

Civil Engineer and Superintendent of Construction.—The United States Civil Service Commission announces an examination, January 8-9, to fill a vacancy in the position of civil engineer and superintendent of construction, at $1,500 per annum, in the Quartermaster's Department at Large. Apply on Form 1312.

Traffic Inspector.—Chief Engineer Fowler, of the New York State Civil Service Commission, announces an examination, December 14, in the various cities throughout the State to fill one or more vacancies in the position of Traffic Inspector for the Public Service Commission, at a salary of $1,800. Apply to the Chief Examiner, Albany, N. Y., before noon of December 7.

Mechanical and Electrical Draftsman.—The United States Civil Service Commission announces an examination, January 8-10, to fill two vacancies in the position of mechanical and electrical draftsman, one at $1,200 and one at $1,500 per annum, in the office of the Chief of Ordnance, War Department. Apply on Form 1312.

Director's Assistant, State Library.—Chief Examiner Fowler, of the New York State Civil Service Commission, announces an examination, December 14, in the various cities throughout the State for a Director's Assistant in the State Library, at a salary of $2,100. Apply to the Chief Examiner, Albany, N. Y., before noon of December 7.

Junior Statistician.—Chief Examiner Fowler, of the New York State Civil Service Commission, announces an examination, December 14, in the various cities throughout the State to fill ten vacancies in the position of Junior Statistician, Public Service Commission, at salaries of from $1,200 to $1,800. Apply to the Chief Examiner, Albany, N. Y., before noon of December 7.

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